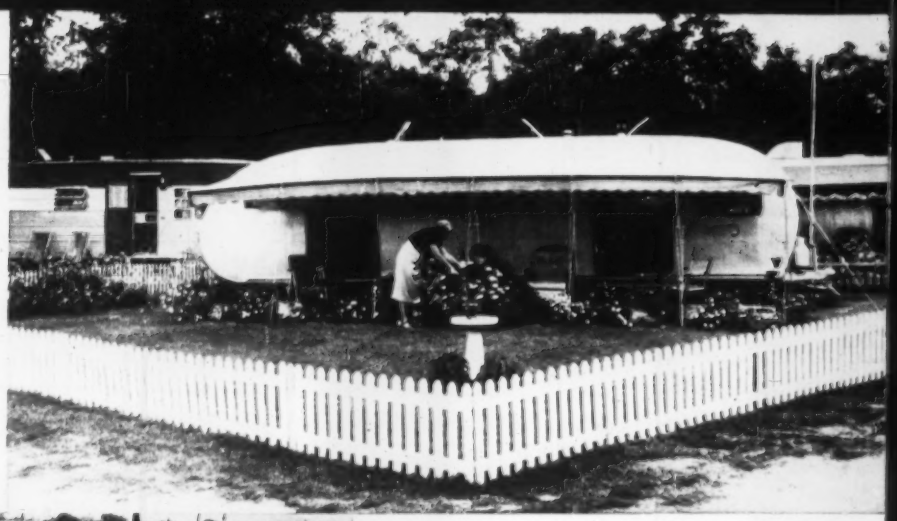
ENGINEERING NEWS-RECORD

- Can builders make money on defense housing?
- Traffic troubles highway turned builders

The Challenge...

Mobilehomes are cutting deep into a market that builders had deserted *p. 40*



...The Answer

A return to the economy home, and adoption of construction methods that make it possible *p. 52*

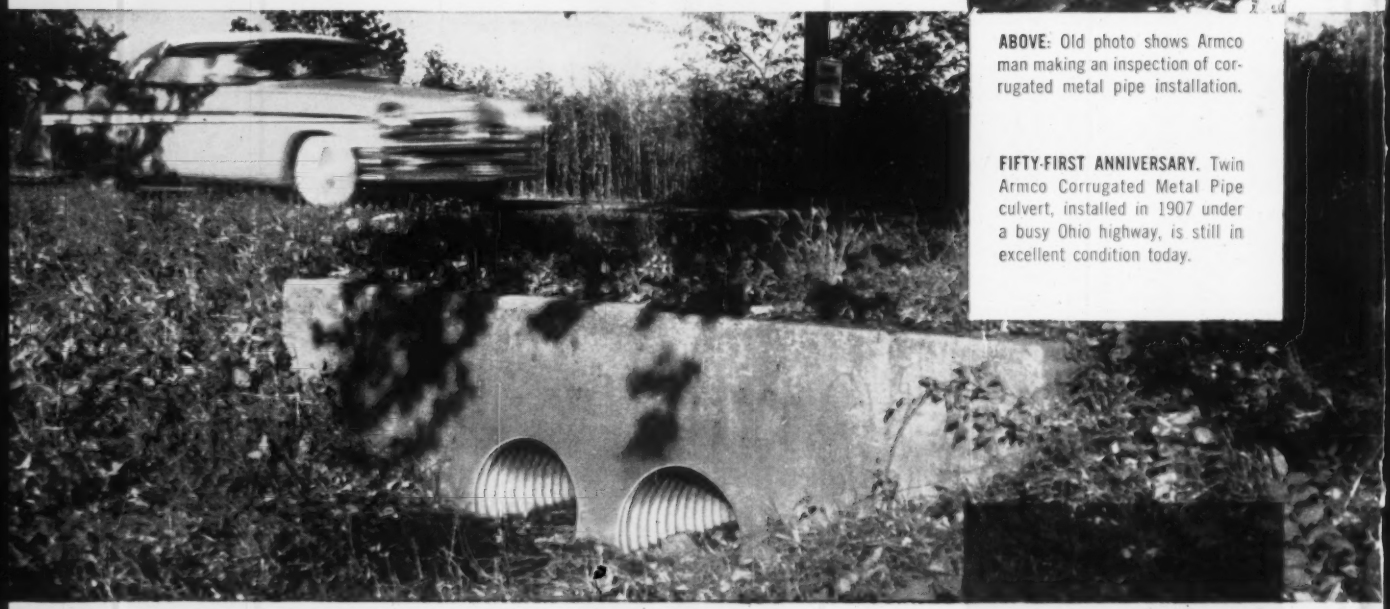
E B POWER GS N
UNIVERSITY MICROFILMS IN
313 N 1 ST
ANN ARBOR MICH

A McGRAW-HILL PUBLICATION

Used on the Nation's Highways Since 1906, Armco Drainage Products Offer You Proved Durability

Armco, Pioneer of Corrugated Metal Drainage Structures, Gives You Assurance of Low Cost Through Long Life

ABOVE: Old photo shows Armco man making an inspection of corrugated metal pipe installation.



FIFTY-FIRST ANNIVERSARY. Twin Armco Corrugated Metal Pipe culvert, installed in 1907 under a busy Ohio highway, is still in excellent condition today.

For the past half-century, Armco Corrugated Metal Drainage Products have been installed under highways all over the country. Many of these old structures are still giving good service today.

Having the advantage of the first Research Division in the steel industry, Armco started early in making field inspections and laboratory tests. These studies helped confirm the durability of Armco Products and aided in developing new ones.

Photos on this page typify the continuing research programs on the durability of Armco Products. To demonstrate their wide acceptance, many corrugated metal drainage products developed or originated by Armco are considered "standard" by highway engineers today.

Hundreds of Armco Sales Engineers, located in all sections of the country, are qualified to help you find an economical solution to drainage problems. And they can assist in expediting delivery of structures from one of the 55 Armco manufacturing plants.

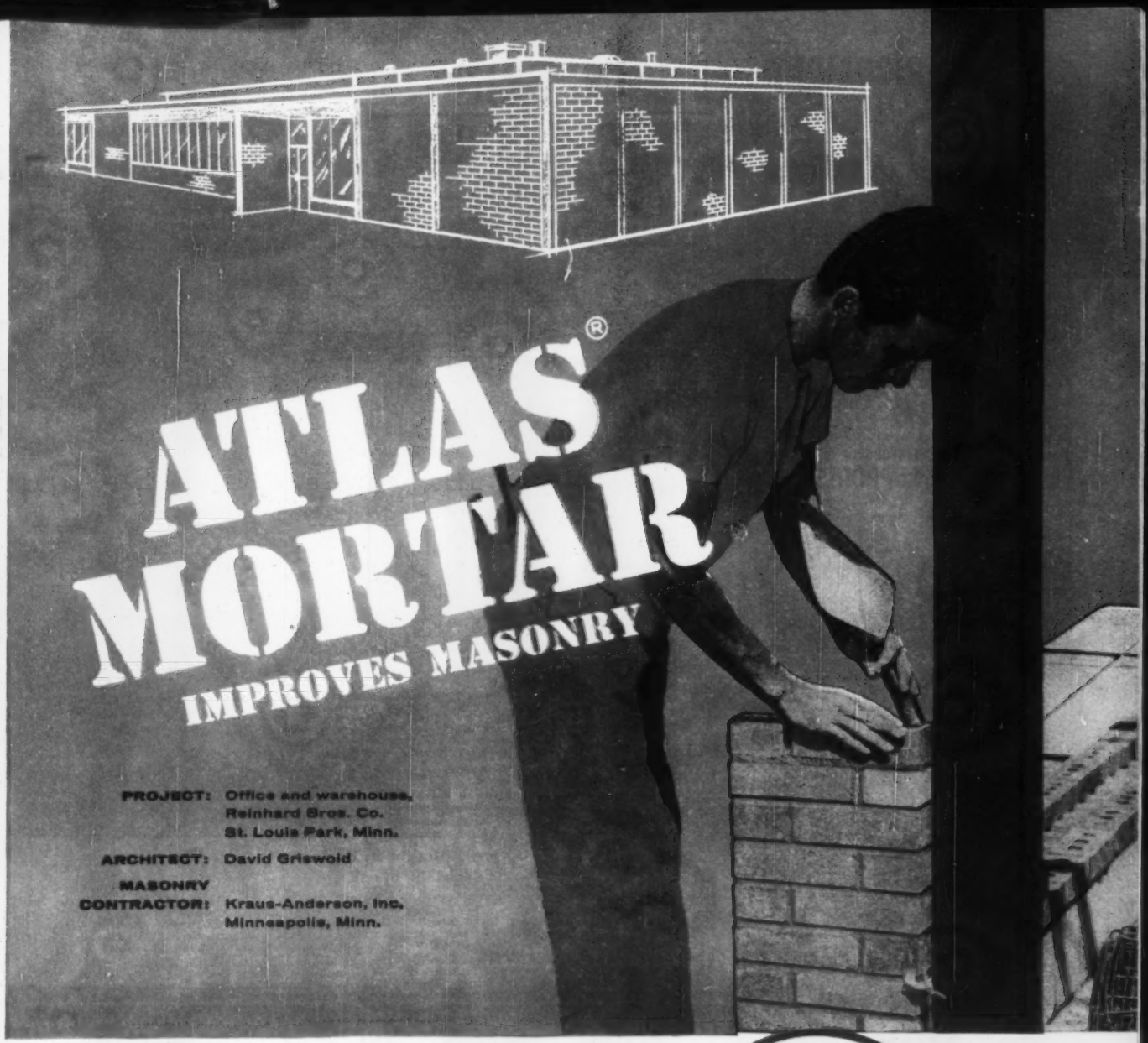
More than 30 Armco Products are supplied for various highway, municipal, railway, and industrial applications. For specific data, write us. Armco Drainage & Metal Products, Inc., 3108 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

SMOOTH-FLO® Sewer Pipe, a new improved product, is designed to assure top flow capacity. It is a typical example of developments originated by Armco.

MULTI-PLATE® is typical of products developed by Armco that have become "standard" structures. This 1931 installation is still in fine shape.

ARMCO®

ARMCO CONSTRUCTION PRODUCTS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IMPROVES MASONRY
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ARCHITECT: David Griswold
MASONRY CONTRACTOR: Kraus-Anderson, Inc. Minneapolis, Minn.

"... provides a more uniform, workable mortar,"

says R. J. Randolph, Mason Foreman
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- To produce serviceable, watertight masonry walls, the mortar mix must be plastic—and have adequate "board life."
- Masons on the job consistently confirm that ATLAS MORTAR cement *does retain* its workability—and gives higher yields.
- Quality-controlled manufacture of ATLAS MORTAR cement maintains high product standards, assuring uniform performance and appearance on every project.

(Complies with ASTM and Federal Specifications.)

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UNIVERSAL ATLAS CEMENT COMPANY—member of the industrial family that serves the nation—**UNITED STATES STEEL**

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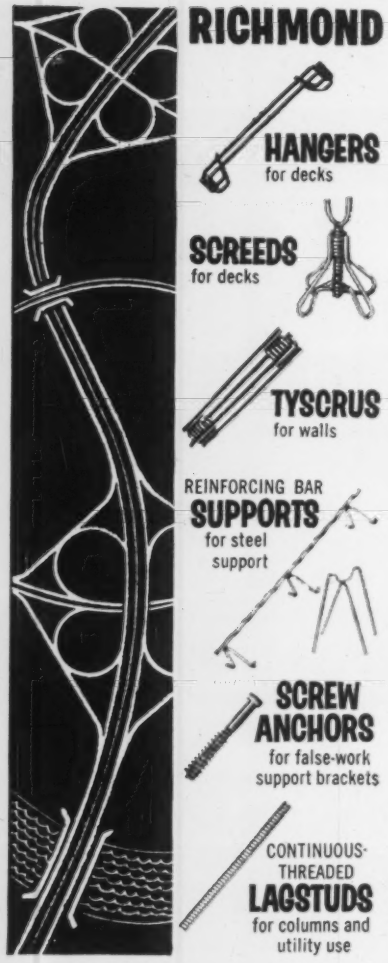

Every contractor on the Connecticut Thruway used Richmond products

In the roadbuilding field, where time is money, concreting contractors rely on Richmond to save both. Richmond products are often a major factor in the profit and loss picture.

You buy 46 years' experience when you specify Richmond products. The current handbook fully describes the entire Richmond line. Write for it, to: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Avenue, Brooklyn 8, New York or 315 South Fourth Street, St. Joseph, Mo.

ENGINEERING NEWS-RECORD

EIGHTY-FOURTH YEAR OF PUBLICATION

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ENGINEERING NEWS-RECORD, Vol. 160, No. 3, JANUARY 16, 1958

Published weekly by McGraw-Hill Publishing Company, James H. McGraw (1860-1948), Founder. Publication Office, 99-129 North Broadway, Albany 1, N. Y. See panel below for directions regarding subscriptions or change in address. **Executive, Editorial, Advertising and Circulation Offices, McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice President; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice President, Publications Division; Ralph B. Smith, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator. **Subscriptions are solicited only from persons with identifiable commercial or professional interests in construction and building. Position and company connection must be indicated on subscription orders.** United States subscription rate for individuals in the field of this publication $6.00 per year, single copies 50 cents; foreign $20.00 per year, payable in advance. Second-Class mail privileges authorized at Albany, New York. Printed in U.S.A. Title registered in U.S. Patent Office. © Copyright 1958 McGraw-Hill Publishing Company, Inc. All Rights Reserved.

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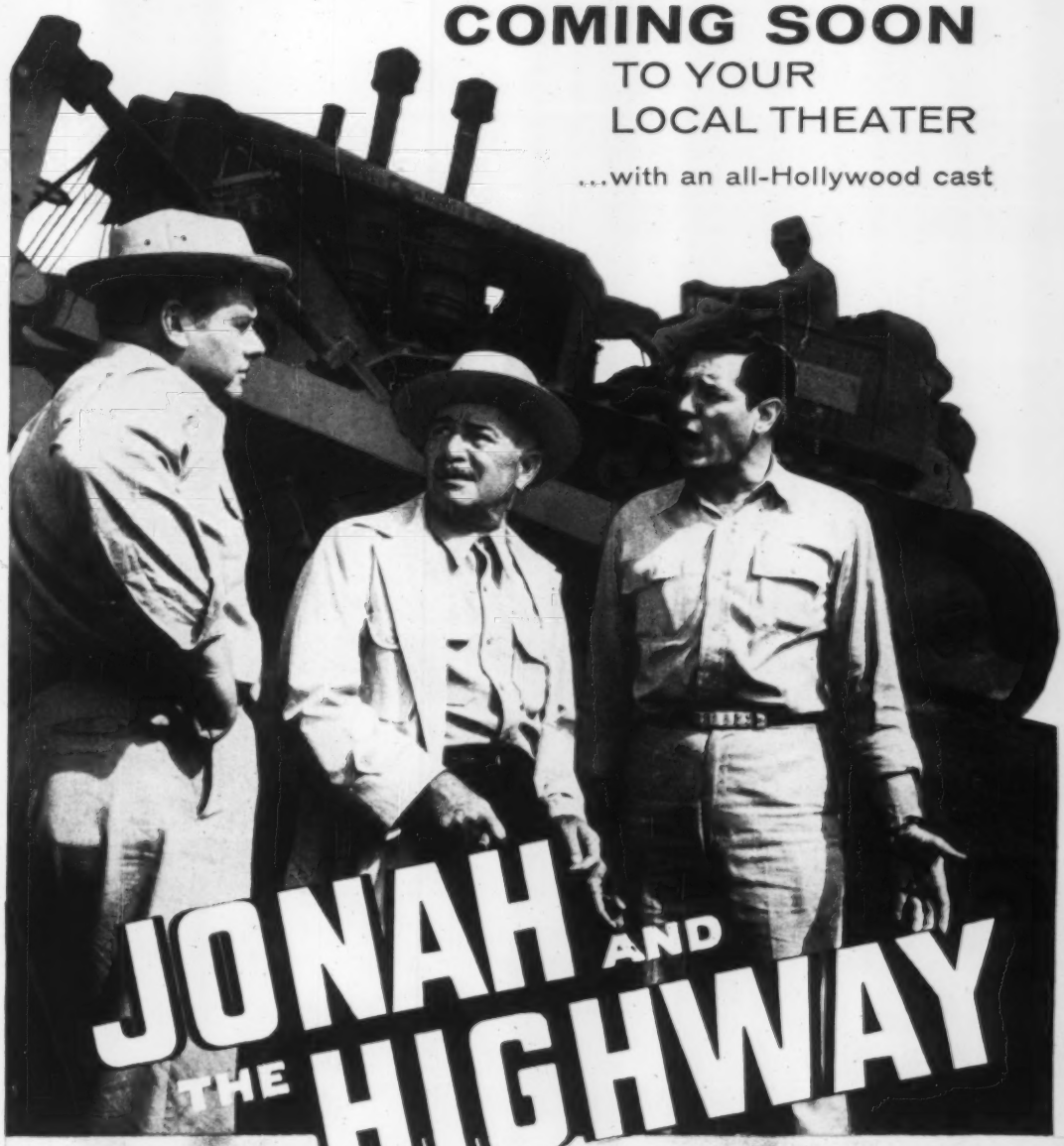
TO YOUR
LOCAL THEATER

...with an all-Hollywood cast



JONAH AND THE HIGHWAY

the show that's on the road

to tell everyone about
the suspense and excitement
the challenges and triumphs

THAT ARE EVERY-DAY OCCURRENCES TO THE MODERN HIGHWAY ENGINEER AND CONTRACTOR

KEEP OUR ROADS ON THE *GO*

Craig STEVENS

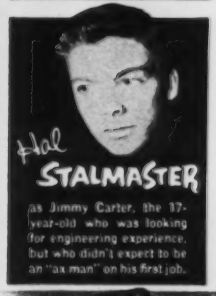
as Bill White, who had worked on two jobs that had gone bad and now felt that he was a "Jonah" to the highway-building business.

Lola ALBRIGHT

as Mary, Bill's wife, who thought he was the finest engineer ever graduated, but wanted Bill to think so too.

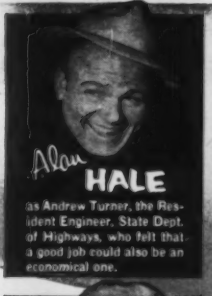
Robert ARMSTRONG

as Jark Thompson, the contractor who didn't like to have unlucky guys on the job, but who also felt every man needed a chance to prove himself.



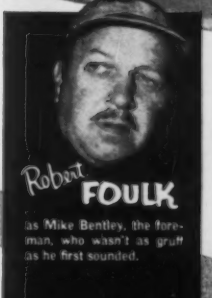
Hal STALMASTER

as Jimmy Carter, the 17-year-old who was looking for engineering experience, but who didn't expect to be an "ax man" on his first job.



Alan HALE

as Andrew Turner, the Resident Engineer, State Dept. of Highways, who felt that a good job could also be an economical one.



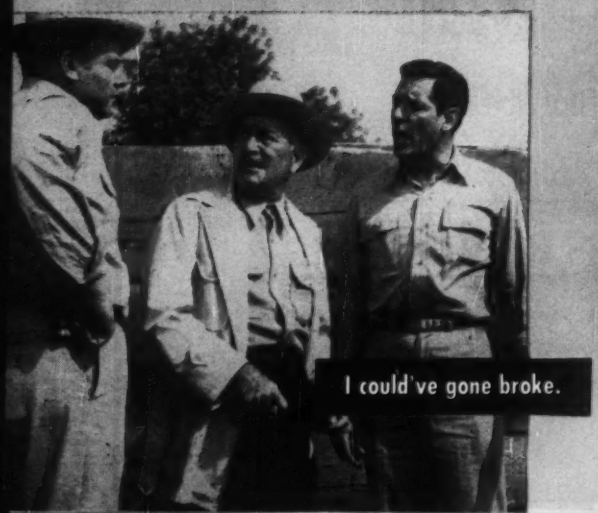
Robert FOULK

as Mike Bentley, the foreman, who wasn't as gruff as he first sounded.

SELECTED MOMENTS OF DECISION, AND OF ULTIMATE TRIUMPH

JONAH THE

You want me, we do it my way.



OF THREATENING DANGER

as seen in

AND HIGHWAY

Let's try that trick we used against the Japs on the Ledo Road.

How do you learn about engineering being an "ax man"?

It's kind of satisfying, knowing something you worked on will be serving people for thirty, forty, fifty years.

USS

Produced by United States Steel in the interest of highway engineers and contractors and the Federal Highway Program.

JONAH AND THE HIGHWAY

is coming soon to your local theater. Be sure to see it!

KEEP OUR ROADS ON THE GO

(This film will be available for private group showings, but not before September, 1958)

Only United States Steel can offer you such a complete line of products for Highway Construction

Special Steels for Construction Equipment

Abrasion-resisting steel
Constructional alloy steel, *Carilloy* and *"T-1"*
High strength, low alloy steels, *Man-Ten, Tri-Ten* and *Cor-Ten*
Grader blades, *AmBridge*
Wire rope, *Tiger Brand*
Tubing, seamless mechanical, *Shelby*

Drainage Products

Sectional plate pipe, pipe arches and arches, *AmBridge*
Culvert sheets, corrugated steel
Culvert pipe
Culvert pipe, perforated
Road flume, *Ro-Drain*

Bridges and Bridge Foundations

Bridge fabrication and erection
Structural steel shapes and plates, carbon, alloy and high strength
Bearing piles, steel H-Beam
Bearing piles, tubular steel, *National*
Sheet piling, steel
Concrete reinforcing bars, straight and bent, *Di-Lok*
Bridge flooring, concrete-filled, *AmBridge I-Beam-Lok*
Bridge flooring, open grid, *AmBridge I-Beam-Lok*
Bridge sidewalk flooring, Tee-type, *AmBridge*
Bridge railing, pipe, *National*
Grating, expanded metal
Expansion joints
Bridge nuts, pins and tie-rods
Rivets
Eye-bars
Bolts, high strength steel
Rivet bolts, high strength steel
Creosote—for pressure treating bridge flooring and wood piling

Pavement Construction Products

Portland cements, *Universal* and *Atlas*
Portland slag cements, *Universal*
Air-entraining portland cements, *Atlas Duraplastic*
Air-entraining portland slag cements, *Universal*
High-early portland cements, *Atlas*
White cements, *Atlas*
Concrete reinforcing bars, straight and bent, *Di-Lok*
Alloy steel reinforcing bars, *Carilloy*
Welded wire fabric for reinforcing concrete, *American*
Stress-relieved strand and wire for prestressed concrete, *Super-Tens*
Concrete forms
Concrete form insulation
Road-joint assemblies, *American*
Air-cooled blast furnace slag, crushed and screened
Air-cooled blast furnace slag, uncrushed
Granulated blast furnace slag

Safety Equipment and Highway Accessories

Beam guard rail, *AmBridge* and *American*
Multisafty Cable Highway Guard, *American*
Highway guard rail, *Western*
Highway guard rail posts
Double-duty traffic markers
Pipe for radiant heating and snow-melting installations, *National*
Electrical wire and cable, *Tiger Brand*
Pipe for conduit, *National*
Generator units, *Witte*
Woven wire fence, *American*
Chain link fence, *Cyclone*
Barbed wire, *American*
Fence gates, *American*
Fence posts, *American*
Fence staples, *American*
Fence tools, *American*
Creosote—for pressure treating wood fence posts
Building construction service
Steel for buildings, maintenance, utility, temporary offices
Joists, open-web steel, *AmBridge*
Sheet steel, corrugated
Sheet steel, galvanized
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Pipe, black and galvanized, *National*

The products and services indicated above are available from one or more of the United States Steel Divisions. USS offices are located in almost all major cities. Feel free to call on the office nearest you at any time—or write to:

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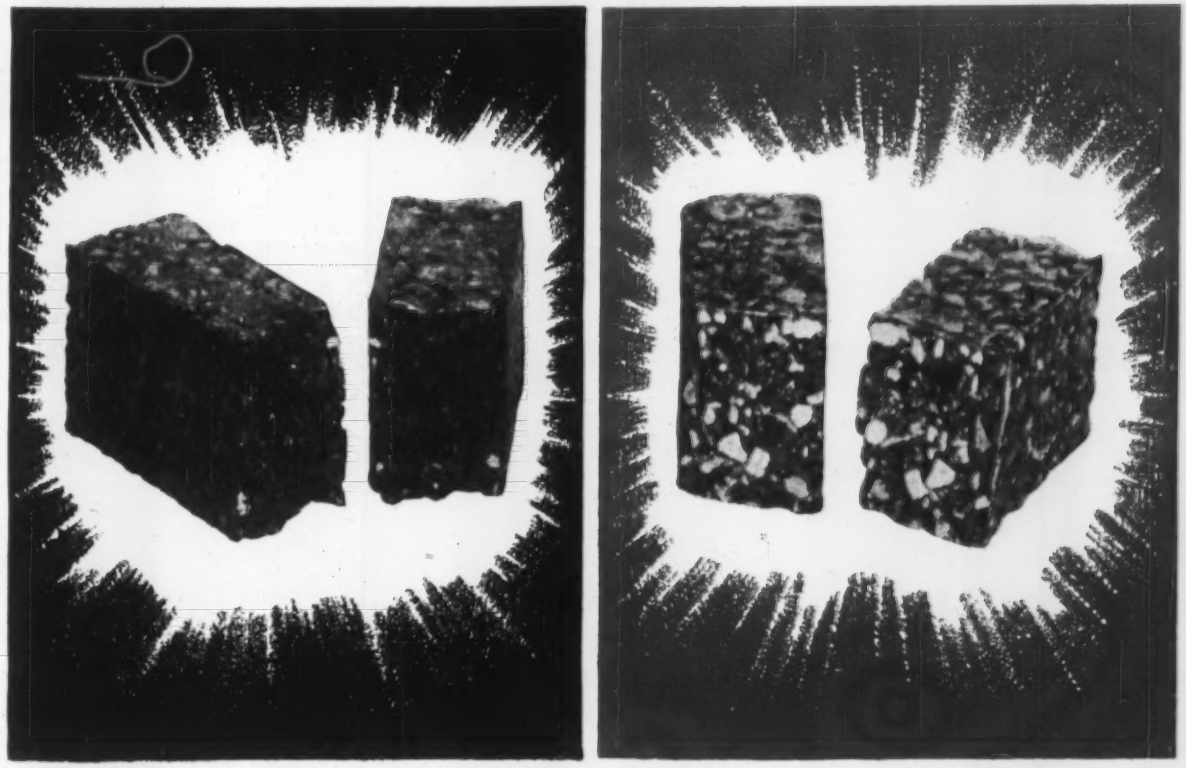
Naugatuck SURFA-SEALZ

RUBBER ADDITIVE FOR ASPHALT PAVING



This picture proves a point

THESE paving-surface specimens, compacted of aggregate and asphalt for standard impact tests, were forcibly broken apart by weights dropped from above. Just *how* and *where* they parted speaks volumes for the addition of *rubber* to asphalt or bituminous cement!

The specimen on the left (#1) contained *no* rubber; while the one on the right (#2) contained Surfa-Sealz® in the recommended proportion. It is quite evident that specimen #1 cracked and separated *through the asphalt*. On the other hand, in specimen #2, the very stones in the aggregate actually fractured before the rubberized asphalt binder yielded, under an impact many times greater than that which split specimen #1.

Call this a labortory test if you will, but what more convincing and practical demonstration is needed to prove the greater toughness and adhesion which Surfa-Sealz adds to asphalt? The advantages are even more pronounced at winter temperatures.

Very little imagination is needed to translate these facts into terms of more crack-resistant highway surfaces and greatly reduced maintenance costs.

United States Rubber

Naugatuck Chemical Division

Naugatuck, Connecticut

BRANCHES: Akron • Boston • Chicago • Memphis • New York • Philadelphia • **Mfg.:** Naugatuck • Gastonia • Los Angeles • **CANADA:** Latex Div., Dominion Rubber Co., Ltd., Montreal • **Cable:** Rubexport, New York
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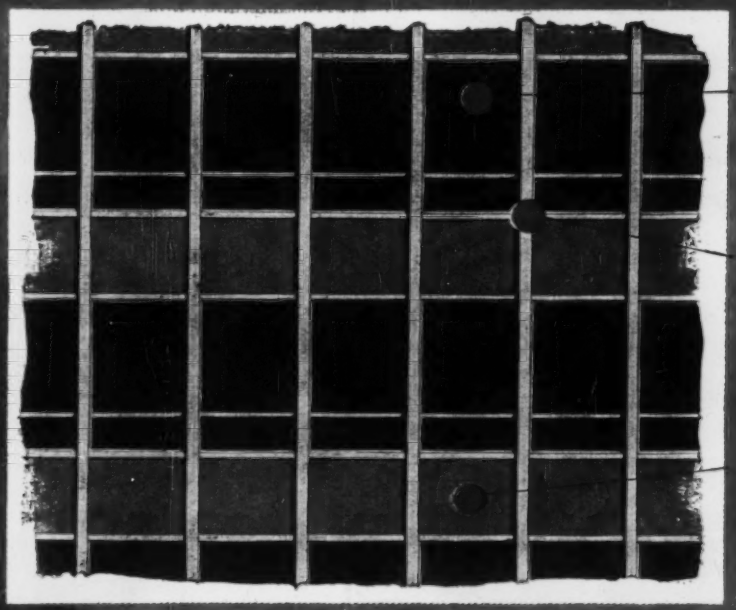
New Versatile-Wall offers weather-

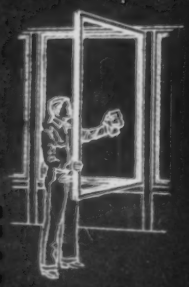
A section 10′ wide by 14′ high with operating sash was tested in a 140-mile wind and 30 gallons of water spray per minute (equivalent to 8″ of rainfall per hour) with no leakage.

With Robertson Versatile Wall, architects and engineers can enjoy full freedom of expression in the use of modular units and colors and still be sure of the precision of fit necessary to resist the ravages of weather. Developed after years of experience, research and testing, this curtain-wall system combines the advantages of standard units with the artistic latitude of tailor-made walls.

The results of extremely severe tests proved beyond a doubt that the rugged, weathertight construction of Robertson Versatile Wall can more than withstand the devastating forces of hurricanes and tornadoes. Units are designed to expand and contract to take care of building movement and steel framing tolerances without loss of tight seal. Yet infinite design variety is available. Verticals can be made with a variety of sizes and shapes in stainless steel, aluminum, bronze or porcelain enameled metal. Spandrels also can be designed in a great variety of colors and textures.

tightness plus extra design freedom





ROBERTSON V-WINDOWS

Exclusive new side hinged inswinging windows make cleaning easier and safer, and seal positively when locked. There is no interference from pivot pins if hopper is used below, and the entire window can be removed in minutes for easy shop reglazing.

MULLIONS AND SILLS

Great versatility is yours. Trim members can be porcelainized aluminum, stainless, aluminum or bronze. Trim also can vary greatly in depth and surface because of new positive "snap-on" design. A system of weep holes provides positive drainage and ventilation for condensation.

SPANDRELS

Here the designer has infinite choice. The V-Panels are available with a wide variety of surface patterns and can be fabricated in aluminum, bronze, stainless steel, Color Galbestos or vitreous enameled aluminum or steel. *Versatile Wall is as individual as your signature!*

Robertson

Versatile

Wall

H. H. Robertson Co.

50 years of experience in Puttyless Glazing Construction
2420 Farmers Bank Building • Pittsburgh 22, Pa.
In England—Robertson Thain Ltd., Ellesmere Port, Cheshire
In Canada—Robertson-Irwin Ltd., Hamilton, Ontario; Edmonton, Alberta

Though any type of window can be specified, there are many advantages to the new Robertson V-Window. Hinged at the side, it swings into the room for safer and easier cleaning, plus a more positive seal than possible with a pivoted window. An ingenious hinge allows the window to be removed and replaced with a spare, so that any reglazing can be done in the shop. Moreover, when a hopper window is specified underneath, weight is better distributed on the sill, and it is not necessary to accommodate pivots.

When you design your next curtain-wall building, take advantage of this completely "weather-wise" system which allows so much architectural latitude. Write for literature.

With 150 trained sales engineers and 60 qualified service dealers, Robertson is ready to serve you in any part of the country. You will always have the best of technical assistance when Robertson products are specified.

Please send additional information.

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TITLE

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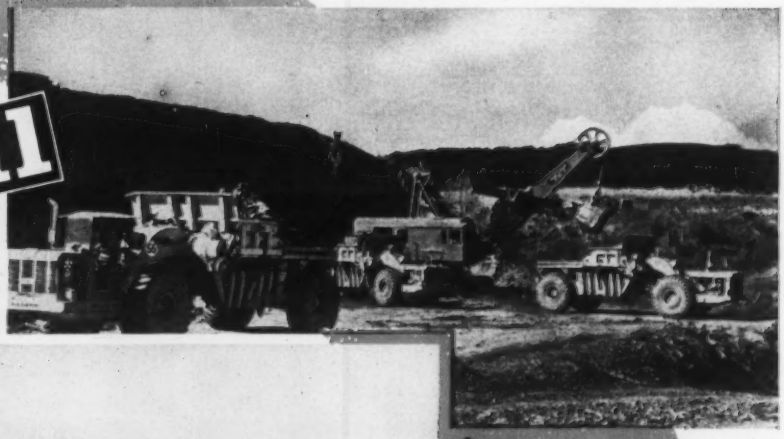
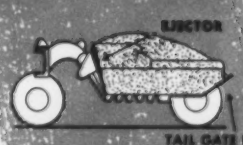
YUBA Movall

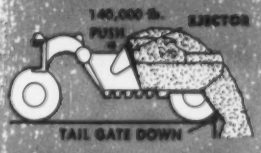


Three of a fleet of ten Yuba Movalls stripping coal overburden at Huntley, New Zealand. These 32-ton capacity units are powered by AC T-360 prime movers.

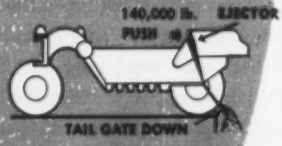
Two 32-ton Yuba Movalls replaced five conventional heavy-duty end dumps on a 5 mile section of Massachusetts Turnpike involving movement of 2,725,000 yards of rock and earth. These are powered by Cat DW-21s.



LOADED — The big target, big capacity body carries its load low, maintaining high ground clearance since frame and body are integral and compact.



DUMPING — Level body offers no gravity resistance, with potential 140,000 lb. ejector push assuring complete positive discharge with minimum use of power.



EMPTY — Sides and bottom are scraped clean, eliminating need for "mucking out" or decreasing capacity for next full load. Complete ejection takes only 11 to 14 seconds.

MA-802

The rugged multi-purpose high speed hauler that outperforms rear-dumps and bottom-dumps on more types of off-highway jobs

These typical jobs illustrate Yuba Movall versatility. Exclusive level action positive ejector discharges heaviest rock, frozen muck, or any top loaded material, or spreads on the fly. High clearance, short turning radius, full stability during all operations, big tire flotation and traction, big capacity—these add up to more yards, less downtime, bigger year 'round profits. For full information, see your Allis-Chalmers, Caterpillar, or International Harvester Dealer—or phone or write Yuba direct.

YUBA MANUFACTURING DIVISION

YUBA

704 EAST H STREET • BENICIA, CALIFORNIA

YUBA CONSOLIDATED INDUSTRIES, INC.

Reader Comment

Desirable Air Changes

SIR—In our opinion, the maximum air changes of four per hour established in working places for the new San Jose city hall (ENR Nov. 28, 1957, p. 31) is much below desirable standards.

Usually, city code requirements will necessitate air changes in any occupied space every 15 minutes. Although the climatic conditions of San Jose are mild, certainly six air changes in all occupied spaces should be considered a minimum.

Maintenance of optimum humidity in summer with this type of installation requires that all latent heat removal be accomplished by the circulating air stream. The surface temperature of piping, panels, etc., must be kept above the inside dewpoint of the space, lest condensation should occur.

There are probably applications where such installations as used for the city hall might prove advantageous, but because of the high heat load due to occupancy we do not believe this is one.

WILLIAM F. RYAN
Ryan Engineering Co.
Salina, Kan.

Future for Prestressing?

SIR—The collapse of the Orlando school roof (ENR Oct. 18, 1956, p. 27 and July 11, p. 28) illustrates some of the difficulties involved in the design, construction and use of prestressed structures. Such structures as long-span roof trusses, bridges and water towers are advertised as being more economical of material and labor than structures built by standard methods.

The structural form of the prestressed girders and beams and the arrangement of steel reinforcing is essentially the same as the old standard except that the appearance is trimmer and more pleasing. Concrete is the most critical material, but unfortunately its manufacture is the most variable of all materials in prestressed structures. The volume of water used, the quality of the sand, crushed stone, or washed gravel and the time of mixing are all of vital importance. It is possible

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Mr. Builder..for 1 home or 10,000 THERE'S A YEOMANS LOW-COST SEWAGE TREATMENT SYSTEM

THE CAVITETTE* FOR SINGLE HOMES!
. . operates where septic tanks won't
. . absolutely no odors

Here are some of the advantages of the CAVITETTE Yeomans Home Sewage Disposer (a single-home sewage treatment system) over the septic tank system:

1 Cavitettes frequently operate successfully on smaller lots than those required for septic systems.
2 Cavitettes can be used to eliminate odors and nuisances of existing septic systems.
3 Cavitettes operate easily in areas where soil conditions prohibit the use of septic tank systems.
4 There is no annual tank cleaning expense . . as is often the case with septic systems.
5 There is no odor . . no backup, no need for cleaning tile beds.
6 Cavitettes are ideal in areas of scattered homes where septic tanks are not permitted . . and where the cost of long sewage lines to a central plant would be prohibitive.
7 Automatic garbage disposal units will not interfere with Cavitette installations.

THE CAVITATOR* FOR 25 OR MORE HOMES!
. . lower cost per home
. . meets State health requirements

Here are some of the advantages of the CAVITATOR community treatment system:

1 Builders find that original cost of Cavitator community systems is up to 40% less than for individual septic tanks.
2 With community systems, local governments often permit builders to use smaller lots . . thus more houses share original cost of the system, not to mention the cost of various other off-site improvements, such as streets and drainage.
3 Community systems improve the value of homes (both to owner and lender) . . make them easier to sell.
4 Municipalities or townships frequently are willing to assume operation of community systems because they are easy and inexpensive to run and maintain.
5 Cavitator community treatment systems produce effluent of the highest purity . . there are no objectionable odors.
6 Cavitator community systems are practical for developments of as few as 25 homes.
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This four-page catalog which tells the story of the CAVITETTE Yeomans Home Sewage Disposer

. . and this 12-page brochure which carries detailed information on the YEOMANS CAVITATOR community treatment system for small communities, subdivisions, motels, resorts, schools, and industrial plants.

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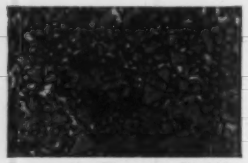
Sandvik Coromant Tungsten Carbide. (Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities—therefore stronger, longer-lived.



Low quality Tungsten Carbide. (Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.

NEXT time you buy bits, specify Sandvik Coromant because they give you more footage per bit, lower drilling costs. Here's why:

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	THREAD	DIAMETERS AVAILABLE (IN INCHES)													
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	1" H	1½	1⅜	1¼	1⅛										
	1 3/16" D					2	2⅛	2¼	2⅜	2½	2¾	3			
	1 1/16" K											3	3½	4	4½
BOTTOMING TYPE	1¼" Rope				1⅛	2		2¼		2½					
	1½" Rope									2½	2¾	3	3½	4	
	2" Rope												3½	4	4½	5
	400					2		2¼		2½					
	600									2½	2¾	3	3½		

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to produce a 5,000 psi concrete in a series of tests easily; but the concrete actually delivered to the job is more nearly 3,000 psi concrete.

There is always the unanswerable question: Will these new procedures result in long-lasting structures? With temperatures ranging between −20F and +110F, and with loads increasing year after year, will these structures stand the service we must expect?

G. L. BILDERBECK
Consulting Engineer
Groton, Conn.

Wright and Architecture

SIR—From the article, "Spiral Art Museum is Built Like a Work of Art" (ENR Dec. 5, 1957, p. 42) I take it that architect Frank Lloyd Wright produces drawings on which the interior dimensions shown on the plans will add up to the over-all dimensions. This is more than can be said of many an "architectural" drawing that has been sent to the field.

Could this be due to the fact that Mr. Wright's early schooling was in civil engineering instead of architecture? If so, his time at the University of Wisconsin was not exactly wasted—even though he now claims: "They don't learn anything in college. I didn't learn anything." (ENR Dec. 5, 1957, p. 112).

R. T. MIOCK
Corps of Engineers
U.S. Army
Seattle, Wash.

Correction

In the article "Prestressed Bars Wind-Brace New Hotel" (ENR Nov. 14, p. 33) the company erecting the steel frame was incorrectly identified. The correct name of the company is the Dominion Bridge Co., Ltd.

CALENDAR

National Association of Home Builders, annual meeting, Conrad Hilton Hotel, Chicago, Ill., Jan. 19-24.
American Road Builders Association, annual meeting, Sheraton-Park Hotel, Washington, D. C., Jan. 20-23.
Associated Equipment Distributors, annual meeting, Conrad Hilton Hotel, Chicago, Ill., Jan. 26-30.
American Society of Heating and Air-Conditioning Engineers, annual meeting, Penn-Sheraton Hotel, Pittsburgh, Pa., Jan. 27-29.
Society of Plastics Engineers, Inc., 14th annual technical meeting, Sheraton-Cadillac Hotel, Detroit, Mich., Jan. 28-31.
National Bituminous Concrete Association, annual convention, Flamingo Hotel, Las Vegas, Nev., Feb. 3-6.
National Society of Professional Engineers' spring meeting, Michigan State University, East Lansing, Mich., Feb. 13-15.

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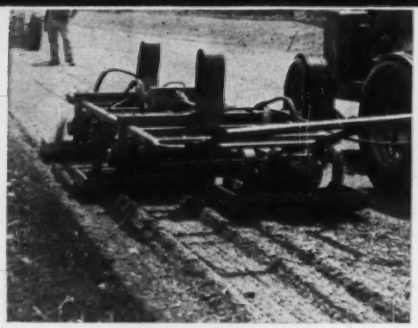

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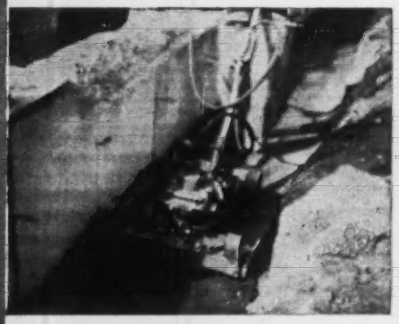

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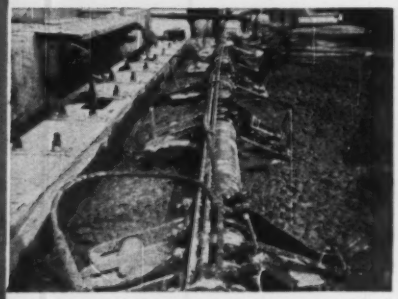

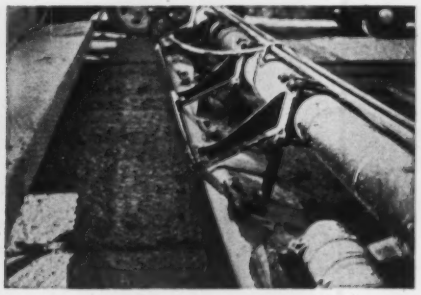

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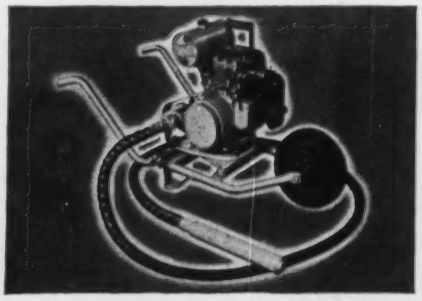
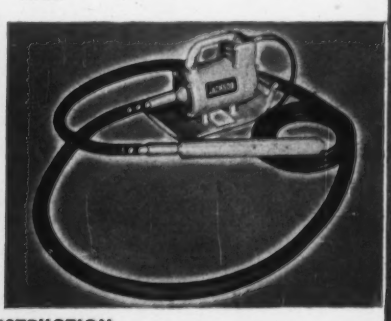
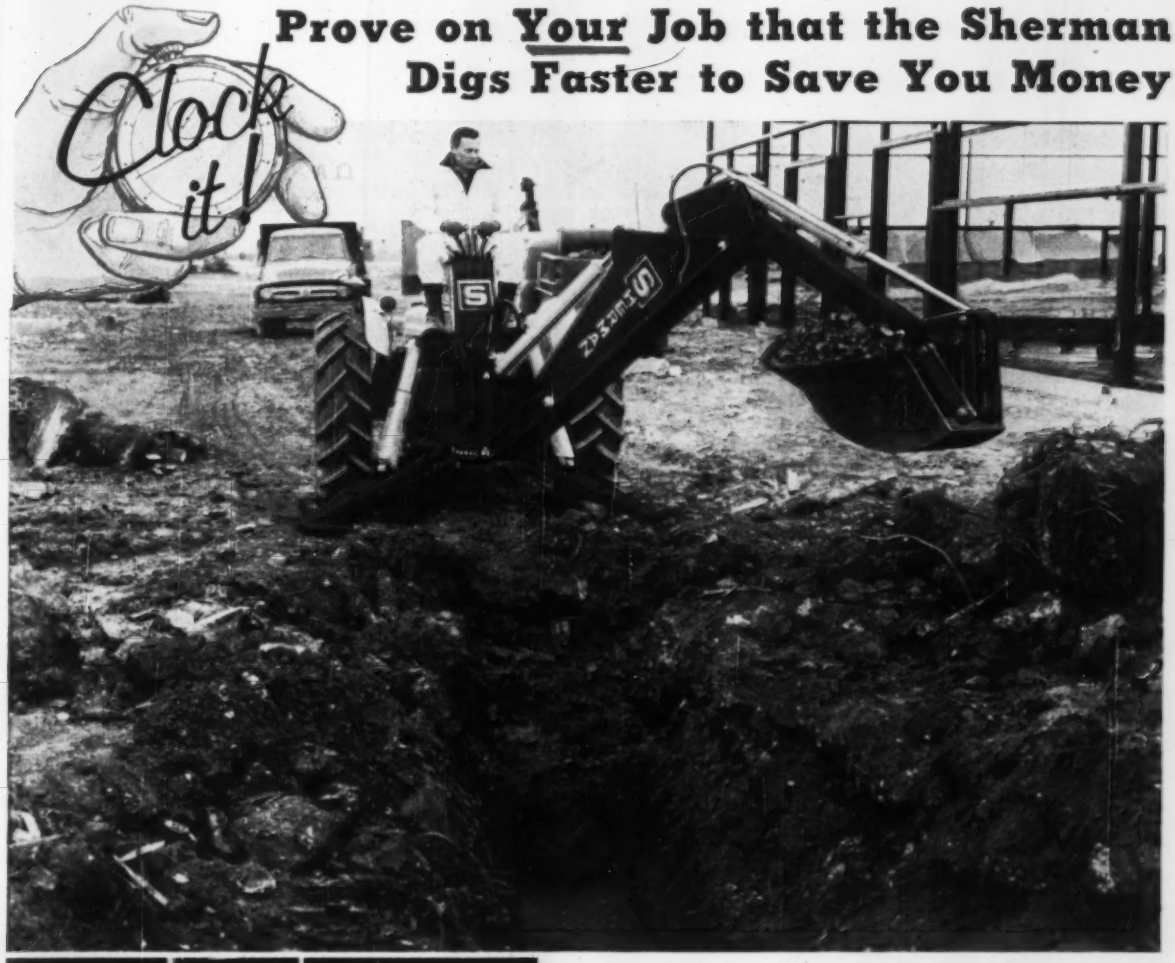




GENERAL CONSTRUCTION

(Left); 6 H.P. engine-driven, flexible shaft vibrator. Excellent for both thin and thick sections. (Right); 2½ H.P. electric vibrator (for light-socket operation). Handy as a pocket in a shirt, powerful enough to handle all general construction concrete vibration with shafts up to 28'.

Prove on Your Job that the Sherman Digs Faster to Save You Money



The recently introduced Model "F" Sherman Power Digger excavates faster than any comparable backhoe!

Hard to believe? Well, don't take our word for it. We challenge you to "Clock it"! Ask your Ford Tractor Dealer to demonstrate the new Sherman on *your* job while you time it with a stopwatch. Prove to yourself that it saves you money by producing more work per dollar invested in time, equipment, maintenance and manpower.

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POWER DIGGERS • FRONT END LOADERS • FORK LIFTS

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beat zero weather with

OLIN POLYETHYLENE FILM

to meet a close deadline for

POLAROID

Mr. Parsons, right, shows Mr. O'Donnell how 006" Olin Polyethylene was stapled to frames made from 1" stock. Mr. O'Donnell's firm, P. J. O'Donnell Co., Boston, Mass., supplied the film.

"Just ask my boss mason, Ted Carter, what Olin Polyethylene meant to us," says Mr. Albert W. Parsons, job superintendent during the building of this new Polaroid plant. "When the temperature goes below 32 degrees, mortar usually freezes, of course. But, because we closed in with Olin Polyethylene, that didn't happen to us. We were able to lay our brick – and comfortably too – even during *zero* weather.

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Olin Polyethylene lets sunlight through . . . saves cost of temporary lighting.

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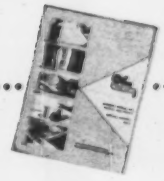
Accepted by VA and FHA
Look us up in Sweet's Catalog (1957 Edition.)
- Industrial Construction File 5/OL
- Architectural File 9/OL
- Light Construction File 3a/OL

Also under . . . AIA File No. 24-D (NN)



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ENGINEERING NEWS-RECORD

Vol. 160, No. 3 January 16, 1958

Number of copies printed this issue, 81,691

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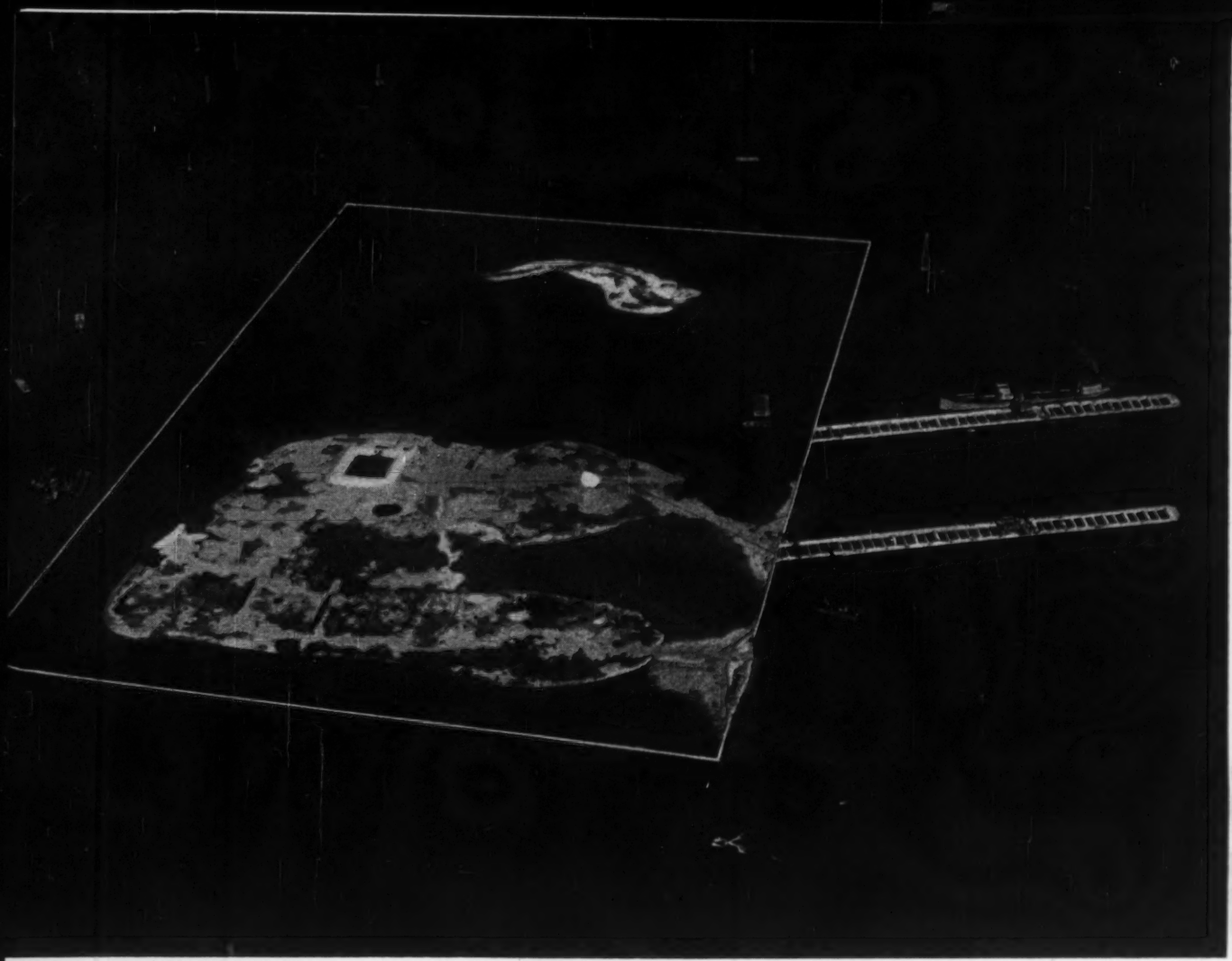
THE CONSTRUCTION WEEK

LOW BID ON NIAGARA—With the bids in on Lewiston powerhouse (see p. 27), the first construction call on the huge $600 million Niagara Power project, the heavy construction industry this week was buzzing with speculation over whether the low bidder, Merritt-Chapman & Scott Corp., would get the job. Three years ago, the Power Authority of the State of New York saw fit to reject the same company's low bid for the St. Lawrence powerhouse and negotiate a slightly lower contract with the second low bidder. In the intervening years, Merritt-Chapman has secured record-breaking contracts, dollarwise, for construction of Priest Rapids ($92 million) and ($108 million) Glen Canyon dams and power plants.

WRIGHT MAY SUE CITY—Architect Frank Lloyd Wright plans to sue Madison, Wis., to compel it to complete the lake-front auditorium and civic center he designed at the city's request. The city claims that, because of a 1957 law passed by the state legislature, it considered its contract with Mr. Wright for the work void (ENR Sept. 26, 1957, p. 26). The law limits the height of buildings on Lake Monona to 20 ft. Wright's plans call for a structure considerably higher. The architect contends the law is not an "unsurmountable obstacle" to construction of his building. He also questions the constitutionality of the law.

FIGHTING SPEECH—Enoch R. Needles gave a short, pointed inaugural speech as he assumed the presidency of Engineers Joint Council last week, calling on all engineers to make themselves heard through their professional societies in 1958. Claiming that "we have not lost our technological leadership or engineering productivity," while questioning its administration prior to Sputnik, EJC President Needles urged the profession to let its voice be heard (see also Editorial page) and also to let EJC be its single, strong voice.

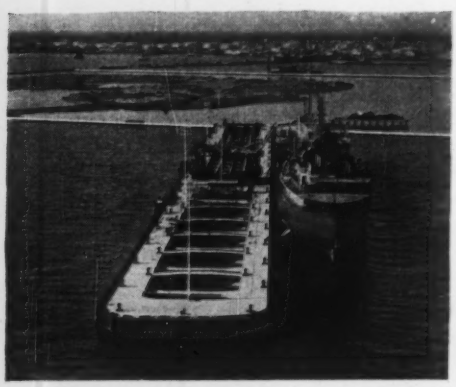
HALF-SIZE DRAWINGS PREFERRED—The Corps of Engineers reports it has substantially cut costs of reproducing construction drawings used for bidding purposes by reducing them to one-half the normal size, or from 30 x 40 in. to 15 x 20. The drawings are reproduced by offset methods. Savings as high as 86% in reproduction costs have been achieved in some Corps district offices. The half-size requires a slightly longer time for preparation in small quantities; where more copies are required, the half-size method is much speedier. District offices and bidders alike generally favor the use of the half-size drawings when both types are available. The former find it convenient for mailings, and the latter find it easier to handle than the big 30 x 40 in. drawings.



The order was to build an island...

AND RAYMOND* DID JUST THAT FOR CREOLE PETROLEUM COMPANY

**In a joint venture with Brown & Root*



Creole needed additional storage and loading facilities at Lake Maracaibo, and the most feasible way to assure enough space was to build an island a half mile from shore. This is no small task, as you may well imagine. Raymond, working in conjunction with Brown & Root, installed a rectangular 2000 by 2900 foot sheetpile wall as the first step. Currently, the section of the lake enclosed is being filled in. When completed, Creole will have an ample 125 acre island for their storage needs. In addition to the island, two 1100 by 80 foot piers were constructed to enlarge Creole's loading facilities by a considerable margin.

But this is just a part of Raymond's many activities in the booming Lake Maracaibo area. Now under construction is a new manufacturing yard to provide a steady flow of Raymond's prestressed concrete cylinder piles, and other prestressed products, for offshore drilling platforms. Raymond is proud of its role at the important Lake Maracaibo region, and of its service to the industry's growth over the past 50 years. Why don't you, too, investigate the advantages of using Raymond methods, materials and experience on your next project?

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OUR 61ST YEAR · FOUNDATIONS FOR THE STRUCTURES OF AMERICA . . . COMPLETE CONSTRUCTION SERVICES ABROAD

WASHINGTON OBSERVER

- Higher federal spending will quicken recovery
- Housing starts may have hit bottom
- Unemployment increase not so high
- Union rackets inquiry widens

- **The Administration is seeking to talk industry into a new round of capital expansion.** The President's economic report, which will be released next week, will be a real persuader. The report, prepared by the Council of Economic Advisers, will diplomatically point out that the new military program—aimed at research into new products—should entice business into an expansion round of its own.

  The expectation is that new plant construction—in electronics and chemicals—will follow, and shorten the economic downturn.

  A second look at construction for 1958 remains good. The Commerce Department's Business and Defense Services Administration underwrites mid-November's estimates that construction will go up 5% during the year—from $47.2 billion to $49.6 billion.

  Lumber shipments will increase to 36 billion board feet—over 34 billion in 1957. That estimate is based on an expected rise in housing.

  Portland cement shipments will go up slightly above the 1957 estimate of 300 million pounds.

  Water and sewage activity will decline. The Commerce group makes its estimate on the present tight money policies—1957 was a bad year, declining 5% from the record 1956.

  Construction machinery and equipment output will go sideways—about $2 billion of output. The estimate is based on current high inventories.

  President Eisenhower's budget (see page 23) has a request for $500,000 to step up the collection of construction statistics.

  Census would be given the green light to start a program to provide better estimates of new construction such as farm, private nonresidential, state and local, and expenditures on repair and alteration of existing property. This would boost Commerce-Labor spending for construction statistics from the present $700,000 to $1.2 million.

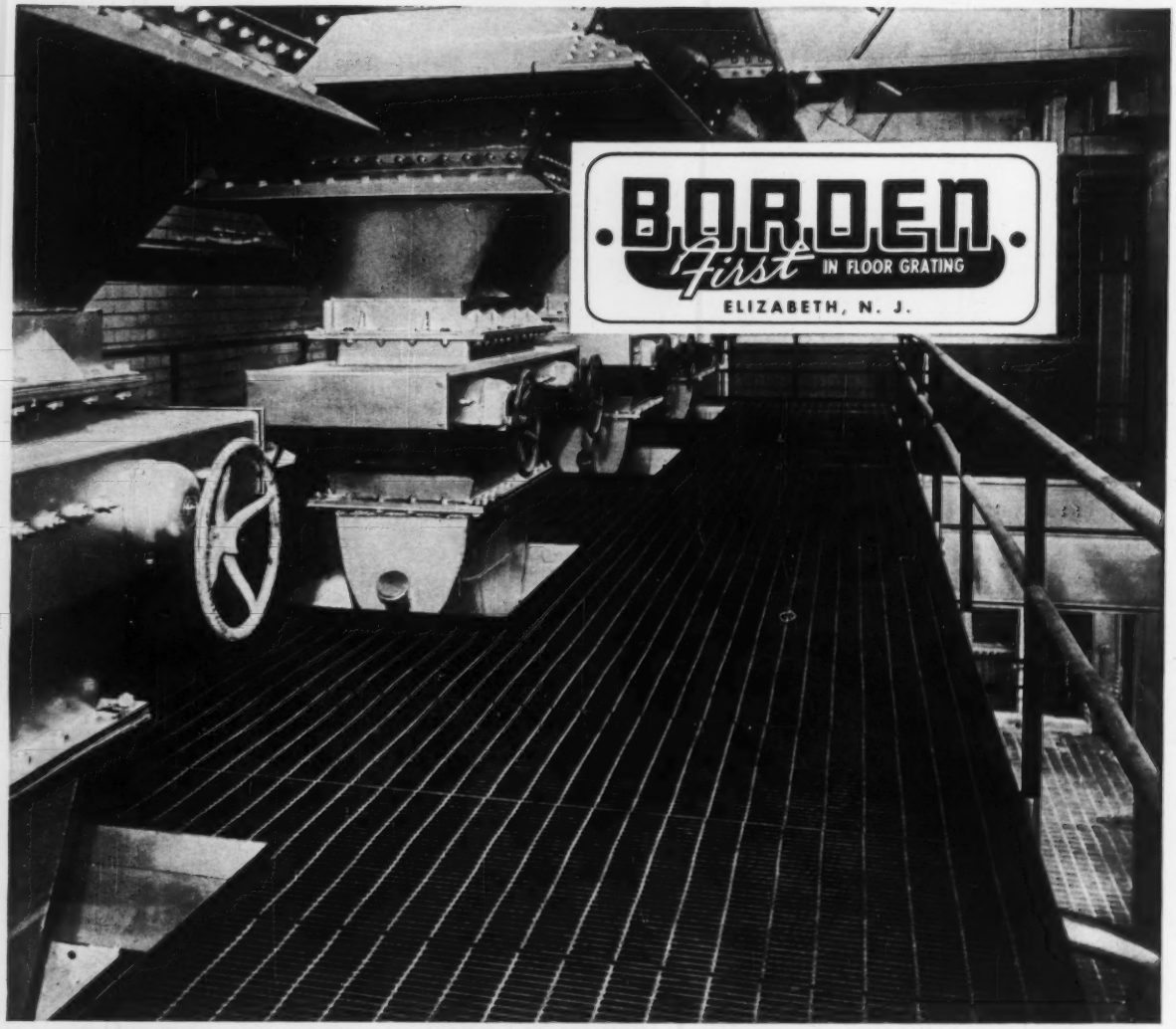
- **Housing starts totals for 1957 give some evidence that the bottom has been reached.** The December estimates out this week total 970,000 private starts. But housing officials believe the year actually will end up just a few thousand starts under one million. BDSA bases part of its construction materials increase on one million-plus private housing market next year.

  FHA is looking for an increase in mortgage applications after midyear. They may go as high as 50%.

- **Unemployment totals are not as frightening as expected.** Many estimators, particularly from organized labor, had expected the December total to go as much as five million. The new figures out this week, under four million, are heartening. But construction employment is still down. Contract construction employment was down 226,000 in December.

- **The operating engineers union is the first 1958 target of the McClellan rackets committee.** Next week, the Senate investigating committee brings the heavy equipment construction union on the carpet for alleged conniving with construction employers, along with a close look at some internal union financial practices.

  Last year it was the teamsters. Now the operating engineers are the major building trades union target. And the committee has indicated it will have open hearings on the carpenters union, too, in the months ahead.



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The President . . .

Gives Congress his program for the year ahead. He would spend $73.9 billion and his . . .

Big Budget Is 10% Construction

Federal construction spending is headed for a new postwar peak. In his $73.9 billion budget for fiscal 1959, President Eisenhower this week forecasts $7.2 billion of construction expenditures during the year that begins July 1. This is $1 billion more than the current year and the highest since 1942.

The absence of new starts for Army Engineer and reclamation projects is only one evidence of Administration belt-tightening. In addition, the President wants to:

- Draw on the highway trust fund for financing of other activites
- Reduce aid to hospitals and to schools in federally affected areas
- Shift more of the cost to the cities for urban renewal projects
- Limit college loans strictly to housing for students and faculty.

Federal grants for construction of waste treatment facilities also would be handed over to the states, the President says, under legislation which he will send to Congress. This transfer promises no budget savings in future years, however, as the federal government in return would relinquish part of its tax on local telephone service to the states.

Whether the coolness on new projects might lead to a Presidential veto of authorization bills passed by Congress is a question that bothers some legislative leaders. The House plans to complete action this year on the $1.5 billion omnibus rivers and harbors authorization bill. This is an improved and expanded version of a measure that the President vetoed two years ago on the grounds that not all the projects had been properly reported and cleared by the Budget Bureau. The current bill is much less vulnerable on this score, but proponents wonder what the President may do with it in the light of new budget policies.

Highways and military construction account for most of the increase in so-called public works spending. The big federal-aid highway program has reached a stage where grants to the states are going to step up nearly $600 million to an estimated total of more than $2.3 billion for fiscal 1959. Accelerated construction of military facilities will increase expenditures in this category nearly $150 million to an estimated level of $2.1 billion next year.

Heavy spending requirements for continuing projects dispelled the threat of severe budget cuts for the Corps of Engineers and the Bureau of Reclamation. The Budget Bureau decreed that programs be carried forward as economically as possible, but restricted construction stretchouts to projects where no loss would result.

Corps of Engineers

The appropriation request includes $491 million for construction, only slightly less than the Corps received for that purpose in the current year.

With carryover funds, this new money is expected to finance $520 million of construction in 1959. The Corps will continue work on 59 navi-

. . . Big budget is 10% construction

gation projects, 101 flood-control projects and 20 multi-purpose projects that include hydroelectric power as well as flood control or navigation.

Bureau of Reclamation

Banning of new starts has caused indefinite postponement of prime contracts which were to have been advertised this winter for the dam and power plant of the $83 million Flaming Gorge project and for the earthfill dam of the $37 million Navajo project, both in the Upper Colorado River development.

However, construction items in the appropriation request amount to some $158 million. Actual construction spending by the bureau next year is estimated at $169 million, an increase of $17 million over the current year.

Public Roads

Since the beginning of fiscal 1957 (on July 1, 1956) the highway trust fund has been the source of all money for federal-aid road construction. Federal highway-user tax receipts are deposited to this trust account to pay the federal share of highway costs.

Expenditures from the fund to meet these obligations are estimated at $1.87 billion in the current year and nearly $2.5 billion in 1959. Estimated receipts for the same years are $2.14 billion and $2.18 billion. The estimates for 1959, however, make allowance for possible changes in the trust fund that Congress will have to pass on.

Military Construction

Appropriation requests emphasize the stepup in defense. Overall, $2.1 million is wanted for military construction. The President already had asked for $520 million of that in the $1.3 billion supplemental defense appropriation bill now before Congress. This money, to be available in the current fiscal year, will go into Air Force projects—dispersal bases, missile launching sites and missile detection systems.

For 1959, the budget recommends another $1.6 billion appropriation for military construction: $965 million to the Air Force, $320 million to the Army and $290 million to the Navy.

Next year's spending by the Atomic Energy Commission for new construction is expected to increase by $20 million to $233 million.

Tennessee Valley Authority

After standing on the sidelines last year on TVA revenue bond financing, the Administration this year is going to introduce its own revenue bond measure. The Administration bill will propose $125 million of bonds for new construction.

Housing

To assure continuity of the urban renewal program, the President asks Congress to authorize grant funds for 1959 and each of the five years thereafter—but on a new basis that would require the cities to pay a larger share of the costs for projects initiated in 1960 or later.

For 1959, he recommends $200 million additional of grant funds. To that would be added $50 million that he is holding over from the $350 million Congress approved for this year. The present federal participation of two-thirds to three-fourths in net project costs would apply during 1959.

After 1959, the President recommends $250 million a year for two years and $200 million a year for the next three.

No additional authorization for public housing is needed in 1959, the President says. There will be a carry-over of 33,000 units that can be placed under contract that year—from the two-year authorization for 70,000 units that Congress approved in 1956—the budget message states.

Budgeted for Construction

Civil Works

	Fiscal Year Expenditures (in millions) 1957 Actual	1958 Estimated	1959 Estimated
Federal Construction:			
Capitol	$15.8	$26.0	$34.8
General Services Administration	26.5	52.6	55.3
Veterans Administration	36.0	39.2	36.0
St. Lawrence Seaway	36.7	43.6	18.7
Tennessee Valley Authority	80.9	130.2	159.2
Department of Agriculture	62.5	68.4	73.0
Corps of Engineers	472.8	485.2	520.4
Department of Commerce:			
Civil Aeronautics Administration	24.4	58.8	128.5
Other	35.6	34.0	7.8
Department of Health, Education, and Welfare	14.6	22.0	25.4
Department of the Interior:			
Bureau of Reclamation	130.5	152.3	169.0
Bonneville Power Administration	27.2	24.3	22.0
Bureau of Indian Affairs	17.2	18.4	24.7
National Park Service	34.6	51.2	44.2
Other	14.2	14.4	12.6
Post Office Department	13.9	32.0	33.1
Department of State	9.6	25.2	33.6
Other	22.3	51.4	62.8
Total, Federal Construction	**1,075.2**	**1,328.9**	**1,461.0**
Grants to State and Local Governments:			
Soil Conservation Service	12.8	21.5	24.5
Civil Aeronautics Administration	20.6	40.1	51.5
Office of Education	67.1	92.9	82.6
Public Health Service	33.9	83.6	119.0
Other	15.9	21.1	17.6
Total, Grants	**150.2**	**259.4**	**295.2**
Loans to State and Local Governments (net):			
Housing and Home Finance Agency	53.3	115.9	172.8
Bureau of Reclamation	.....	3.8	3.8
Other	11.5	16.2	17.3
Total, Loans	**64.8**	**135.9**	**193.8**
Trust Funds			
Federal Construction	.5	6.2	49.1
Grants, Bureau of Public Roads	952.6	1,751.9	2,328.9
Total, Trust Funds	**953.1**	**1,758.0**	**2,378.0**
Total, Civil Public Works	**2,243.2**	**3,482.3**	**4,327.9**
Expenditures for REA Loans, Nonprofit:			
Hospitals, etc	353.3	466.6	533.6
TOTAL, CIVIL WORKS CONSTRUCTION	**2,596.5**	**3,948.9**	**4,861.5**

Defense

Military Public Works	1,986.0	1,963.0	2,104.0
Atomic Energy	263.0	214.0	233.0
TOTAL, DEFENSE CONSTRUCTION	**2,249.0**	**2,177.0**	**2,337.0**
TOTAL, FEDERAL CONSTRUCTION	**4,845.5**	**6,125.9**	**7,198.5**

Builders Do Well on Capehart Housing

- **Successful bidders like it enough to take on more**
- **But they find some aspects unnecessarily costly**
- **So they are urging improvements in the law**

The Capehart program for constructing privately financed family housing for military personnel is proving profitable for both the federal government and the builders, an ENR survey shows.

The program is not without its drawbacks, however. A big one is the requirement that contractors provide financing at 4% interest. Others, say the builders now at work on Capehart projects, include government red tape, difficulty in determining the chain of command and opportunity for speculators to participate in the program. As a result, the builders are eager to suggest improvements in the program.

• How the plan works

Now entering its third year, the Capehart program originally was Title VIII of the Housing Act of 1955. Later legislation extended it to June 30, 1960. Proposed by Sen. Homer Capehart of Indiana, it has the objective of providing housing for married personnel of officers and upper enlisted grades without increasing the national debt, as would be the case if Congress appropriated federal funds for the purpose.

There is a big need for military family housing at military bases. Last summer, the Defense Department told Congress that the three services required more than 290,000 additional family units. About 95,000 units had been programmed at that time, largely under the Capehart program. The net deficit in family quarters amounted to nearly 200,000 units, more than 140,000 of them in the U. S. Cost of the units needed probably would exceed $4 billion. Hence, the Capehart plan relieves the national budget of a substantial sum.

Plans for the projects are prepared under design contracts awarded by the Defense Department to architects or architects-engineers with offices in the states or areas where the housing is to be built. The design is submitted to the Federal Housing Administration for approval for a government-insured mortgage loan. In addition, the credit of the federal government backs the loan.

Contractors then are requested to bid on construction of the projects, including in their bid the cost of financing at 4% interest. The mortgage loan is to be repaid in 25 years or less, but not less than six years. When the housing is completed, it is turned over to the Defense Department, which assigns military families to the units and repays the mortgage loan from the quarters allowances appropriated by Congress each year.

• What builders like

The plan, the ENR survey indicates, appears to be working well. At present, the military services have about 31,000 units under contract in about 50 projects ranging in size from 30 to 2,000 or more units. And the builders are making money; those contacted by ENR said they will continue to bid on new Capehart projects.

One of the most appealing characteristics of the program is that the builder does not have to worry about housing requirements.

"Capehart projects are very attractive for anybody with an interest in mass house building," says John Sherman, president, Sheridan, Inc., who is involved in several of the projects. "The chief attraction, of course, is that the houses are pre-sold and hence there are no problems or costs in selling them."

Some of the builders also report that the housing is not difficult to construct. However, they held different opinions as to the effect on construction efficiency of supervision by the various federal agencies.

"Inspection should be left to FHA, not the military," says one builder. He believes also that FHA is better qualified than the military to establish housing requirements.

Another builder, when asked if he would take on another Capehart project in view of his current experience, replied that it depended on whether it would be under the supervision of the Corps of Engineers or the Air Force. He says the Corps of Engineers, due to its experience, "can interpret specifications with respect to field conditions." He calls attention to a project that will be finished six months ahead of schedule, "as a result of Corps cooperation."

As a consequence, this builder recommends that the Air Force use the Corps for its building or set up its own corps of engineers.

Still another builder said he had good results with Capehart housing projects because he is working directly with architects and engineers, rather than with the military.

• What builders dislike

The biggest gripe the builders have about the Capehart plan is the requirement that they finance the projects at 4%. Because of the tight money market, most of these projects have obtained their mortgage financing from the Federal National Mortgage Association. FNMA makes advance commitments for purchase of mortgages and takes the paper on completion of the projects unless private lenders have agreed meanwhile to put up the money.

For all practical purposes, the $416 million authorized for Capehart mortgages has been used up. Unless Congress votes additional authority to FNMA, bidders on Capehart projects will have to obtain financing from private sources.

John Sherman's complaint is typical: "The availability of interim financing at the proper price has always been a problem with Capehart. Now, with the difficulties in getting FNMA money, takeout financing has also become a problem. When we first got into Capehart housing, we could obtain commitments for 102 points, which is better than FNMA (99). Now, we can't even get FNMA, and the marketing and financing situation is such that commitments are forced down to 96 or 97."

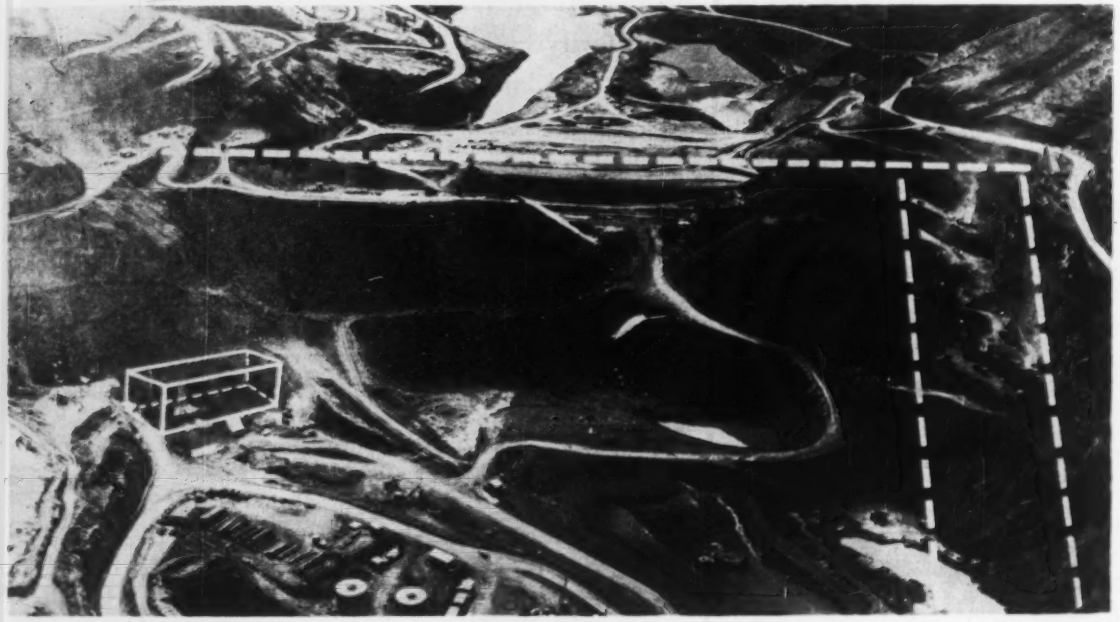
Bob Bergstrom, of John P. Hopkins Co., Mercer Island, Wash., suggests: "The bidding agency should notify prospective bidders as to the availability of FNMA funds. Some contractors will bid a job with the expectations of getting FNMA money; then, after getting a job, they find the money is not available. Delays of six to eight months often occur after the opening of bids. In other words, permanent financing should be arranged before bids are called, and the bidding agency so stipulate."

Another builder argues: "Financing could be worked out at a much lower cost through some channel other than contractors. For example, all of our banking connections are local; but on our contract we had to go 'outside.' Naturally, these lenders slapped us with all the market could bear."

Another complaint about the Capehart program was: "There are just too many high-powered speculators and fringe crooks getting into the program. It looks like the only thing that will stop these crooks is a 100% performance and payment bond."

So while the Capehart program is working well, it can be made less costly.

Engineering News-Pictures



Dam Work Heads Down the Homestretch

Brownlee Dam—Idaho Power Co.'s hydroelectric project in remote Hells Canyon of the Snake River—has been pushed to the 72% completion mark. The downstream rockfill embankment section is being "topped out" this month, thus achieving the goal of placing fill higher than the lower spillway outlets before the 1958 flood season. The entire embankment (395 ft high and 1,380 ft long) is expected to be finished by late spring (ENR Feb. 7, 1957, p. 46).

Movie Plot to Have Unusual Ending

Where many a bad guy bit the dust, a $400 million building development is about to rise in West Los Angeles. Twentieth Century-Fox Film Corp. last week announced a seven-year program to convert 176 acres of its 284 acre studio property—which includes the former ranch of silent-screen cowboy star, Tom Mix—into a city of 56 apartment houses, four office buildings, a hotel, shopping center, motion picture museum, theater and auditorium. Welton Becket Associates, Los Angeles, are the architects.

Priest Rapids Progress

The end of the year showed the $91.8 million Priest Rapids Dam on the Columbia River in Washington one-third complete dollarwise. The light streak running through the center of the photo is the impervious core of the 4,500 ft left embankment. In the cofferdam area, work on the 1,025 ft powerhouse, spillway and fish passing facility is under way. Merritt-Chapman & Scott Corp. is contractor. Supervision is by Harza Engineering Co., Chicago.

Electronic Highways Are Here

Research into highway problems should not stop with specific problems involved in the actual engineering of roads and the materials that go into them. Quite properly, it should also involve such questions as the effect of a highway program on the communities served, and on people themselves; the reasons for the ever-increasing size of automobiles; the best methods of educating engineers and technical personnel; the new relationship of country to city area; the future of rail and air transport.

With that kind of a keynote, nearly 2,000 members of the Highway Research Board got down to work last week in Washington for a week-long annual session that saw presentation of more than 225 papers, several motion-picture presentations, at least six panel discussions; and all-day sessions that started at 9 am and often ran through until 11 pm.

• **Electronic controls**—Practical steps toward the eventual goal of taking control of motor vehicles completely out of the hands of their drivers under certain circumstances by means of electronic devices, are now possible, according to V. K. Zworykin and L. E. Flory, of RCA Laboratories of Princeton, N. J.

The steps can be taken to control existing vehicles, with or without special attachments. Key to the systems proposed is to place controls in the highway, rather than in the vehicle. A combination of three basic elements is involved: a detector system to note the presence of the vehicle on the road; a signal (either by lights or radio) that would advise other drivers of the vehicle's location; and a means of actually guiding the vehicle's wheels to keep it in its proper lane.

As worked out by RCA for a 300-ft test section installed recently near Lincoln, Neb., the detector system is in fact a continuous series of electronic wire loops buried in and along the roadway. Associated equipment then notes the presence of the car, and passes along information to activate other parts of the system.

The signal thus generated was called a "flying tail" by the authors. It is in fact a series of lights which follow the first car at a preset distance, thus warning other drivers of its presence. The "tail," incidentally, can be extended so that it appears in front of the vehicle being marked, to warn drivers approaching on a curve or over the brow of a hill, or in other hazardous situations.

The guidance system consists of a buried cable down the center of the lane, with a pick-up coil on the car to receive the signal. These coils will control the power steering mechanism, to keep the vehicle on a straight path.

The first two of the elements of the system can be installed on highways now, without the need for any special attachments on vehicles. The third element—actual automatic steering and speed regulation—would require installation of equipment in the vehicle.

The authors pointed out that the warning "tail" could eventually be a radio signal that could control speed of the vehicle, by controlling acceleration and braking.

• **Education and Sputniks** — Most thought-provoking material for the assembled scientists—from a broad, viewpoint—was contained in the addresses that opened the meeting.

Said Detlev W. Bronk, president of the National Academy of Sciences:

"In a time when men are thinking of space travel, we tend to forget or belittle our own accomplishments. The highways are a vital part of our economy and our way of life—and the fact that we are engaged in a highway program of the present magnitude is something we can be proud of."

On the matter of education—particularly in a "Sputnik age"—Maynard W. Boring, chairman of the Advisory Board on Education for HRB, and an industry technical manpower recruiter for many years, had some sober thoughts:

"Congress will very soon get a number of bills to provide money and scholarships in order to increase the number of engineering students. We of the scientific professions should study these proposals carefully—and should make sure that the considered opinion of the professions is made available to the Congress before it takes any final action.

"The fact is that the biggest obstacle to our educational program today is the supply and quality of the teachers—not the lack of students. Recent salary studies show that the median salary for teachers in the universities doesn't quite reach $8,000. That's not enough to attract—and keep—the caliber of teaching staff that we must have.

"I can say for much of industry, too, that what industry wants of the universities is less specialization for the students. It wants a great increase in the teaching of the basic sciences, and it wants no decrease in the humanities. But it doesn't want as much specialization among the students as is now the case. What industry wants is men who have been taught to think—not specialists in some subdivision of engineering. We need men who have the basic education that will allow them to fit into the engineering world wherever they are most needed."

• **Psychology**—In one address, Dr. Leonard J. Duhl, of the National Institute of Mental Health, called attention to mental and emotional pressures that can be generated by such a project as a highway cutting across an established community. Disruption of accustomed patterns of living, said the specialist, can result in almost mass reaction of the community evidenced by juvenile delinquency, and social upheavals. Remedy, he said is avoidance of such community disruption where possible, or at least education aimed at reorientation of the community and wider understanding of the benefits to be gained through the construction of the project.

Bruce D. Greenshields of the University of Michigan reported on a study of traffic accidents and traffic flow in relation to the driver's satisfaction in operating his vehicle. His conclusion: The less effort involved in driving, the more satisfied the driver, and the less accidents occur.

$98 Million Low Bid

Huge Niagara powerhouse draws four bidders

Merritt-Chapman & Scott Corp., New York, bidding without the aid of joint venturers, was apparent low bidder last week for the main powerhouse of the Niagara Power Project at $98.3 million. This single bid is second in size only to MC&S's successful $108 million bid for Glen Canyon Dam on the Colorado River, now under way. And the company's flag flies on the $91.8 million Priest Rapids Dam contract, the previous record for dollar size of a single construction contract.

The Power Authority of the State of New York received three other bids for the Lewiston power plant, all from joint ventures. Perini Corp. sponsored a group (Walsh, Langenfelder) that bid $101.8 million. Guy F. Atkinson Co. headed an 11 member combine (Ostrander, American Pipe & Construction, Arundel, Hunkin-Conkey, J. A. Jones, Harney, Isbell, Kettlewell, Maguire and Dixon) that was third low at $104.3 million. And Niagara Constructors (Kiewit, Morrison-Knudsen, Kaiser, S. J. Groves and Cunningham-Kiewit) bid $117.2 million.

Lewiston was first estimated at $71 million in 1956, but more recently, as the design took shape (and costs continued upwards), PASNY expected a low bid between $80 million and $100 million. The work encompasses an 1,100 ft long powerhouse and its forebay to be cut into a 45 deg, 310 ft high cliff at the edge of the Niagara River (ENR Aug. 27, 1957, p. 27). In effect, the tall cliff will be moved back about 300 ft to make room for the penstocks and powerhouse.

Now 11 Stories High . . .

. . . To Be Enlarged to 19

Now 11 stories high, Bankers Trust Co.'s 52-year-old structure on the southeast corner of Fifth Ave. and 44th St., New York, will be stripped down to its steel frame and floor slabs above the third floor and rebuilt to a height of 19 stories. The existing frame will be able to support five floors, but to strengthen it enough for all eight would require interrupting the banking operations that are to continue on the first two floors and basement. The solution adopted by the Clarson Co., who leased the property from the bank and will carry out the $6 million job, is to suspend the top three stories partly from steel trusses cantilevered from a new 19 story, steel-frame, aluminum-walled extension to be built next door and integrated with the existing structure.

Emery Roth & Sons are the architects, James Ruderman, the structural engineer, and Diesel Construction Co., the contractor. Shreve, Lamb & Harmon, architects, and Purdy & Henderson, engineering consultants, are representing the bank.

How Much Do the States Get?

Apportionment of federal roadbuilding funds to states revised as estimates of interstate program costs rise

Congress got a progress report on the first 18 months of the national highway program last week and the news was both good and bad.

Secretary of Commerce Sinclair Weeks reported that the rate of progress achieved during the first six months of the program had been maintained and accelerated during the last 12 months when funds equal to the total amount authorized for fiscal 1957 had actually been obligated for approved construction plans and right-of-way acquisition before June 30, 1957.

Cost of the interstate system (which originally was to be completed in 13 years at an estimated cost of $27.6 billion) now is up 37%. The Commerce Secretary estimates that it will require $33.9 billion in federal funds and $3.7 billion in state matching funds—on a 90-10 matching basis—to complete 38,548 miles of the 40,000 mile network.

[The Secretary did not include in his estimates the cost of the additional 1,452 miles of highways (most of it already allocated to the states)—the result of mileage "savings" in laying out new routes under the huge super-highway program. Cost of this mileage would increase Weeks' $37.6 billion estimates to perhaps $39 billion. In addition, the Secretary did not include in his cost estimates the 1,000 miles of highways Congress authorized for the interstate system without authorizing federal payment of 90% of the costs.]

These factors were cited as responsible for the increased cost:

- Highway construction costs are up 12% during the interval between 1954 and the last half of 1956.
- Traffic volume forecasts are 15% higher than previously estimated.
- Lighting, utility adjustments and other incidentals cost more than when Congress approved the program in 1956.
- More interchanges, grade separations and other structures are required.

The increased estimates provide revised apportionment factors for the states, which is the percentage that each state gets during a year of the total amount available to all the states. California, for example, has the largest apportionment factor—10.1%—which means that it will get 10.1% of the remaining $32.1 billion of federal aid and state matching funds to complete the system (see table). Now that the apportionment factors have been revised, it will be necessary for Congress to pass a concurrent resolution approving the new estimates so that the Secretary can apportion to the states federal-aid money for fiscal years 1960, 1961, and 1962.

Secretary Weeks also reported on a study made for Congress in connection with reimbursing the states for tollroads and free highways built between Aug. 2, 1947, and June 30, 1957 that are put into the interstate system. To date, some 10,859 miles of the 38,548 miles of approved locations meet the criteria for consideration and reimbursement. This breaks down between 1,950 miles of tollroads and 8,909 miles of free highways in 47 states. If the states were to be reimbursed for these, it would come roughly to $6 billion which would come out of interstate funds.

Here's Where Money Goes

State	Costs (thousands of dollars)	Apportionment Factors (percent)
Alabama	633,865	1.972
Arizona	439,093	1.366
Arkansas	319,170	.993
California	3,266,360	10.162
Colorado	249,063	.775
Connecticut	392,013	1.220
Delaware	113,203	.352
Florida	832,849	2.591
Georgia	775,563	2.413
Idaho	221,635	.690
Illinois	1,648,267	5.128
Indiana	927,049	2.884
Iowa	304,996	.949
Kansas	287,539	.895
Kentucky	564,914	1.758
Louisiana	849,040	2.641
Maine	165,352	.514
Maryland	724,032	2.253
Massachusetts	895,066	2.785
Michigan	1,263,033	3.930
Minnesota	606,017	1.885
Mississippi	353,074	1.098
Missouri	916,933	2.853
Montana	365,399	1.137
Nebraska	198,231	.617
Nevada	168,060	.523
New Hampshire	176,652	.550
New Jersey	1,040,156	3.236
New Mexico	385,022	1.198
New York	1,592,022	4.953
North Carolina	174,329	.542
North Dakota	142,313	.443
Ohio	2,093,853	6.514
Oklahoma	292,064	.909
Oregon	557,135	1.733
Pennsylvania	1,310,912	4.078
Rhode Island	149,684	.466
South Carolina	264,751	.824
South Dakota	136,146	.424
Tennessee	953,218	2.966
Texas	1,452,251	4.518
Utah	300,543	.935
Vermont	303,076	.943
Virginia	1,362,018	4.237
Washington	581,976	1.811
West Virginia	402,881	1.253
Wisconsin	338,565	1.053
Wyoming	334,065	1.039
Dist. of Col	318,607	.991
Total	**32,142,055**	**100.000**

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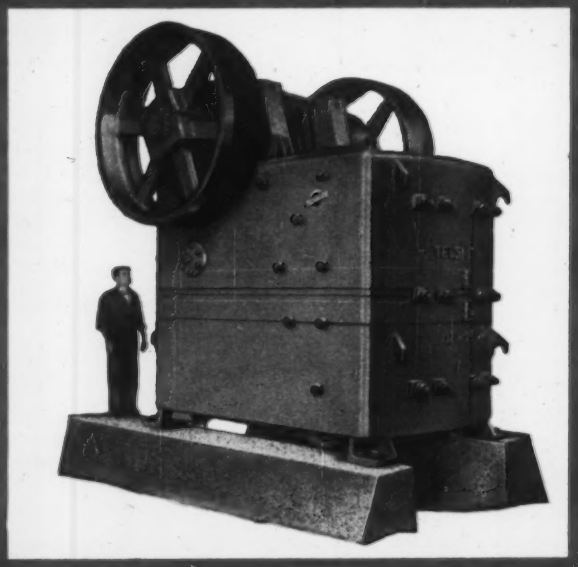
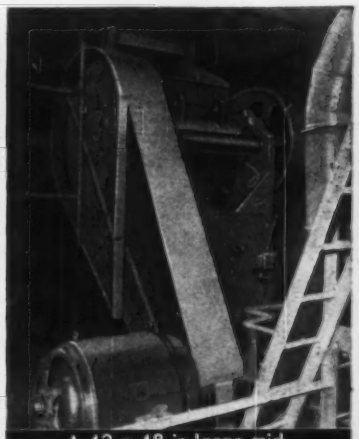


J-2

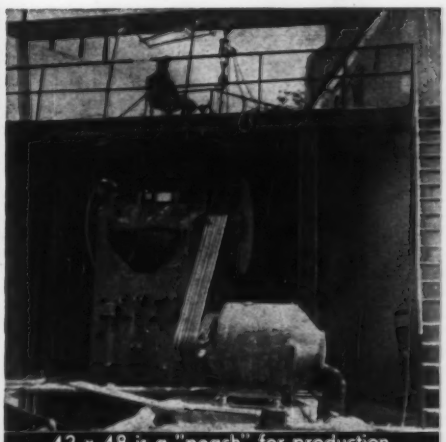
Producing aggregate for St. Lawrence Seaway with 42 x 48

Mounted 42 x 48 for road construction in Oregon

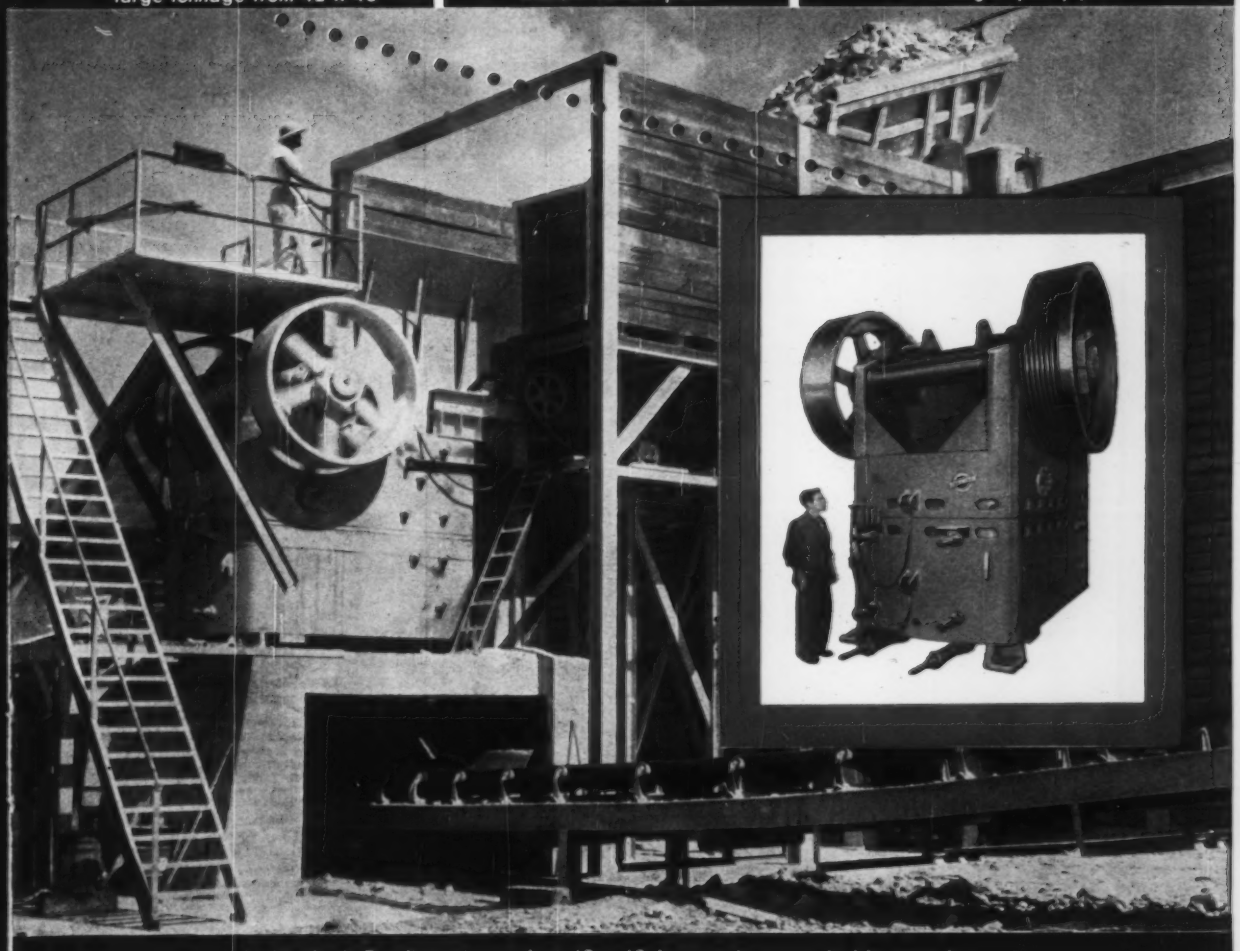
Alabama crushing plant gets large tonnage from 42 x 48



A 42 x 48 in large mid-western cement plant



42 x 48 is a "peach" for production in Georgia quarry plant



In this North Carolina quarry plant 42 x 48 Jaw again proves its big capacity

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How a Four-Man Crew laid 1500 feet a day of CLOW Bell-Tite® pipe through Florida swampland

CLOW cast iron pipe, with the sensational Bell-Tite joint, proved its advantages conclusively in this Clearwater, Florida, installation.

That a four-man crew was able to lay this CLOW Bell-Tite pipe at 1500 feet a day under these adverse conditions is definite evidence of the time, labor and money-saving advantages of this CLOW-designed joint. Two men worked in the trench—often in 3 feet of water. One man lubricating and aligning the joints, the other assembling with a pinch bar. A crane operator and a hook-up man completed the crew.

CLOW Bell-Tite forms a pressure-tight joint—instantly—no bolts or follower glands required. Under practically all conditions, it is the fastest, easiest and most economical pipe for water main installation. Underwriters' Laboratories Inc. listed in diameters 3- through 24-inch.

Shows simple assembly of CLOW Bell-Tite joint. Just wipe clean, lubricate and push spigot into the bell. When painted yellow stripe is no longer visible, joint is bottle tight.

Under-water assembly of 8" Bell-Tite pipe at Clearwater, Fla.
Contractor: Hancock Pipe Company, Clearwater, Fla.

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Composting Fizzle

Reopening of heralded plant appears doubtful

The much-publicized McKeesport, Pa., composting operation of the Organic Corp. of America (Orcoa) is foundering financially and appears about to go under for good. However, its product, commercial fertilizer from decomposed garbage, has done a satisfactory job for those who bought and used it.

Orcoa's McKeesport plant began operating in July, 1956, under a 10 year contract between the company and the city which provides that Orcoa will handle all of the city's refuse and garbage for a fee to the city of $250 a month (ENR Sept. 6, 1956, p. 26). The company would keep all proceeds derived from the sale of fertilizer.

The plant operated without adverse publicity until August, 1957. Fertilizer was marketed for $64 a ton in 50 lb bags and $135 a ton in 5 lb bags. According to H. G. Burr, president of Orcoa, a ton of waste yielded a half ton of fertilizer.

Then on August 7 the roof started falling in. Five employees formed a picket line at the plant to complain that their recent paychecks had bounced and that Orcoa owed them back wages. Next day, Mr. Burr was arrested on charges of passing worthless checks and it was learned that the plant's power was to be shut off and the firm's insurance was lapsing. On August 11 the composting plant was idled and McKeesport began hauling garbage to a sanitary landfill.

• **Asks new contract**—Then ensued a hectic period of negotiations that provided almost a daily story for local newspapers. Mr. Burr complained that the contract was too liberal and asked McKeesport officials to pay Orcoa 50 cents a cu ft for waste delivered to the plant and forego the $250 a month fee (which is actually rent for city-owned land the plant occupies).

The city, in the meantime, entered into a sanitary landfill contract, indicating it had little confidence in the reopening of the Orcoa plant. Then in response to Orcoa's latest request for contract changes, the city on December 4 filed suit to acquire the plant on the grounds that Orcoa was not fulfilling its legal obligations under the original contract.

Shortly afterwards, Mr. Burr stated the composting plant would resume operation in January, but did not say how. January has now come, the plant remains idle and there are no signs that it will reopen (though there are plenty that it will stay inoperative).

Mr. Burr, in an interview with ENR, blamed his problems on "marketing difficulties" and "competitive pressures from industry." He declined to elaborate. He did say the plant cost $450,000 to build and that Orcoa was capitalized at $1.5 million.

He described the Orcoa composting operation as a "hot fermentation process" that employs cultured bacteria. Waste was said to decompose over a period varying from 14 to 21 days.

In the fall of 1957 Doris Duke, the tobacco heiress, put up a $50,000 option to buy Orcoa. According to Mr. Burr, the option expired without Miss Duke taking any action.

While the composting plant was operating, the city was satisfied. The mayor of McKeesport has estimated that the city saved $35,000 a year by turning its waste over to Orcoa.

N.Y.-N.J. Transit

Bi-state agency, rail loop for metropolitan problem

A permanent bi-state agency to solve transit problems in the New York-New Jersey metropolitan area is one of the recommendations in the final report last week of the two year study by the Metropolitan Rapid Transit Commission.

Another recommendation is the building of a bi-state rail loop that would cost an estimated $498.5 million. This plan is a modification of the one presented last May (ENR May 30, p. 24).

The new agency would be called the Metropolitan Transit District of New York and New Jersey and would be governed by a council of 16 members from each state. It would be empowered to acquire, construct and operate transit facilities. Capital needs would be financed by issuing bonds backed by pledge of its revenues and certifying annual deficits to the counties involved.

Alcova Dam Ice Floes Hit, Down Two Small Bridges

Two wood bridges near Casper, Wyo., were swept away by large ice floes when the Bureau of Reclamation released 1,000 cu ft per second of water from Alcova Dam to begin a four month test of how fluctuation of flow in the North Platte River would affect downstream water-users.

One bridge, about 20 miles downstream of the dam, went out a few hours after the water was released when ice chunks up to 20 ft in diameter struck the bridge's piers. Two days later a second bridge, 45 miles from the dam, was damaged. The tests were temporarily discontinued after the bridges were damaged.

Briefs

• **Airport under way**—Construction has begun on the first phase of a $46 million expansion of the passenger terminal area of Los Angeles International Airport. Work on the 265-acre site is scheduled for completion in 1960.

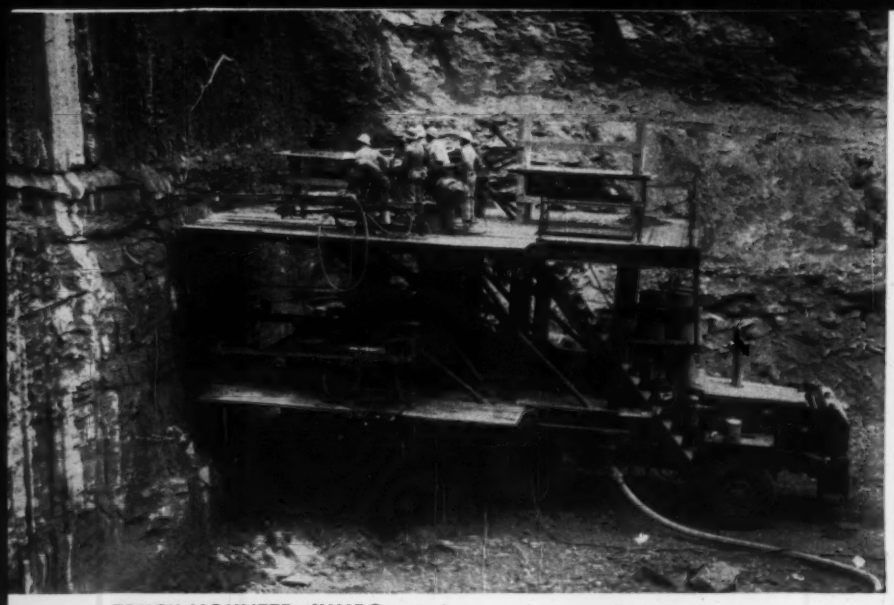
• **Christmas present**—Aring Equipment Co., Inc., Milwaukee, skipped the usual Christmas presents to customers this year and, instead, put the money into two civil engineering scholarships—one at Marquette University and the other at the University of Wisconsin. All those on the firm's Christmas list received a greeting with this explanation: "We hope in this way to make a more significant contribution to the industry by helping alleviate the critical shortage of engineers."

• **Community aid?**—Pennsylvania's Secretary of Labor and Industry, William Batt, Jr., has urged Pennsylvania communities to organize citizens' committees to help solve local labor problems. He thinks such units could help to avert strikes or lockouts and to settle disputes.

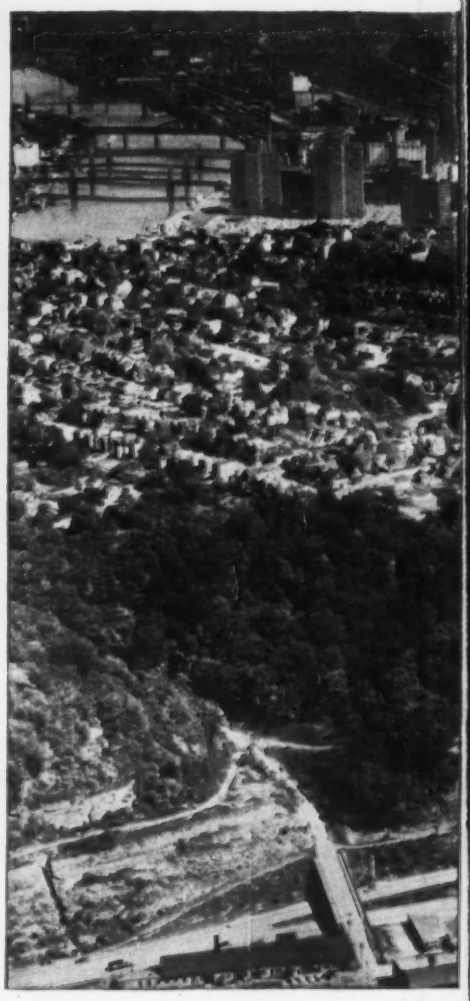
• **School building research**—The Ford Foundation this week announced a $4½ million appropriation to be used to find ways of improving the construction of school and college buildings. The money will be used to establish and support for the next five years the Educational Facilities Laboratories, a nonprofit organization that will sponsor construction research and disseminate information to architects and others concerned with school design and construction.

• **Inland waterway plans**—New Jersey will spend more than $8 million on beach protection and inland waterway projects in the next fiscal year under a program recommended by the state's Department of Conservation and Economic Development. More than half this sum is devoted to filling beaches by spreading 2.3 million cu yd of sand along an 11-mile beachfront near Asbury Park. Pending Congressional approval is a Corps of Engineers recommendation that the federal government put up $1.5 million for the project.

• **Inland waterway traffic**—Barge traffic on the nation's inland waterways increased markedly in 1957 for the twelfth consecutive year. Carriers hauled an estimated 123 billion ton-miles last year, which amounts to 8% of total intercity transportation. Present inland fleet now operating in the U.S. includes 12,500 dry-cargo barges with a capacity of 9.8 million tons, and 2,200 tank barges that can hold 3.2 million tons.



TRUCK-MOUNTED JUMBO, which scoots from one bore to the other, starts key highway tunnels.



To tie a major traffic interchange to Pittsburgh's downtown Golden Triangle (background), twin bores will go under residential Mt. Washington. But since their far ends will open immediately onto a bridge that is yet to be built over the Monongahela River, these . . .

Twin Highway Tunnels Are Driven From

Using the middle of one of the nation's busiest highway intersections as a working site from which to construct a twin-tube rock tunnel is an exercise in housekeeping, safety and precisely scheduled operations.

Such a site is dictating construction procedures for the 3,430 ft rock bores that will become—in two years—Pittsburgh's Fort Pitt Tunnel.

The south portal is quite literally in the middle of the intersection of Parkway West, and Saw Mill Run Boulevard, main route to the city's airport and to large suburban areas to the west and south of the city proper. It is additionally complicated by two railroad trestles that cross the intersection at a high level. The working area available is the space between the opposing lanes of the two divided highways, plus a 0.7 acre area gouged out of the hillside.

Machinery, trucks carrying away spoil, workmen and supplies must pour through two narrow funnels, under strict orders not to interfere with the flow of some 30,000 vehicles which move around the intersection every day.

• **Big part, big plan**—The tunnel itself is a part of an overall $150 million program that is changing the Steel City from a motorists' nightmare into a much more pleasant kind of a dream.

No matter what his objective is, any highway planner in Pittsburgh will have to contend with the area's rugged hills, covered now with homes and businesses that climb up the sides and over the tops, and with a crazy quilt of streets running in every direction to follow the contours of the original ground.

Relatively high (up to 1,400 ft above sea level), steeply cut by three rivers and their tributaries, the hills have forced growth of the city (population about 700,000) and its suburbs into an east-west pattern. The narrow passes through which any north-south traffic must go have been growing into colossal bottlenecks for an area that depends on surface transportation—both private and commercial—to get its workers and shoppers to and from their homes.

The traffic program (ENR July 11, p. 64) includes extensions and completions of expressways, a number of major interchanges, a brand-new Fort Pitt Bridge east of the existing Point Bridge, and the twin tubes of the Fort Pitt Tunnel to connect with the new bridge.

• **One end only**—Being driven through the base of a hill known locally as Mt. Washington, the Fort Pitt Tunnel has two peculiarities for the construction contractor:

Its twin tubes start at the same level at the south portal, but the easterly of the two (which will carry northbound traffic) will be 18 ft higher than its

One End Only

twin at the north portal, to meet the double-decked bridge.

The north portal will be on the edge of a sheer cliff overlooking a four-track railroad line and the Monongahela River, so that no tunnelling operations can be carried out from that side.

The necessity of working from only one end of the tunnel governed the thinking of Merritt-Chapman & Scott Corp. the general contractor, when the firm submitted its successful low bid of $10.6 million for the tunnelling work.

According to James O. Irwin, MC&S project manager, the thinking went this way:

After a jumbo had drilled the roughly 110 holes necessary the jumbo, loading equipment and trucks would have to move out of the way of the blast—and the jumbo would have to stay out of the way while mucking operations proceeded.

(*Continued on page 36*)

SOUTH PORTAL of new Fort Pitt Tunnel is only heading for twin tubes. Two-acre area provided by initial cut is total working area available to contractor.

. . . Tunnel muck is piled for later disposal

CLEAN, SHARP DEFINITION of portal face is result of careful line-drilling in shale, precise blasting techniques.

Why let the jumbo and its twelve drifters stand idle? Why not move the rig into the second bore and keep it working, while the first tunnel was mucked out?

• **Build your own**—There was a hitch of course: A conventional rail-mounted jumbo (nothing more than a heavy platform on which are mounted the drills, or drifters) couldn't be shifted from one tunnel to the other without a great deal of trackage, overhead wires and switching equipment. Besides, the rail-mounted rigs require a lot of taking up and putting down of rails, ties and other equipment.

Another problem might be the time taken to switch the jumbo, particularly when the twin tubes began to get well into the tunnel—say a thousand feet or more.

Irwin—much of whose experience has been in hard-rock tunnelling in the U. S. Southwest—found an answer by building his own jumbo to suit his needs.

He started with one of the heaviest trucks he could find—a 50-ton Mack off-highway hauler. On this he built two platforms, one above the other, to a height of about 26 ft. On the platforms are mounted the twelve drills—11 of them capable of cutting 2 in. holes, one with a 5¼ in. bore. And atop the upper platform he installed a set of controls corresponding to those in the trucks cab—so that the huge rig can be driven from either end.

It works this way: The truck is in fact backed into a heading—but driven and steered from the upper platform so that it can be brought into any position against the working face that the boss driller desires.

After drilling is completed and a shot is ready, an operator in the truck cab drives straight ahead to get the rig out to the portal, and across to position to enter the second shaft. Here the man on the platform takes over control again, and backs the machine into the shaft for another round. Only the trailing hoses that feed compressed air to the drills must be reeled in as the truck moves toward the portal, and paid out again as it goes back. The truck engine, plus auxiliary generators mounted on the platforms, provide all needed light and power excepting for the compressed air.

Moving at an average speed of about 5 mph, the rig can be shifted from one heading to the other in perhaps a half-hour, even when the tunnels are nearly at their full length.

• **But don't truck it**—Another part of the contractor's thinking was concerned with the related facts of his small working area, disposal of the muck, and the necessity—once tunnelling started—that the work continue on a round-the-clock basis, with no interruption because of weather or traffic.

The decision was not to haul the muck to the disposal area, but to haul it out of the tunnels as short a distance as possible, stockpile it there for re-handling by a subcontractor.

Reasons Irwin: The only available disposal area is a deep ravine about a mile and a half west of the tunnel portal. Only way to reach the disposal area is via Parkway West itself, then via a steep, clay-surfaced construction road. The Pennsylvania State Highway department wouldn't permit off-highway equipment on the parkway.

"Our problem", comments the job boss, "was whether to sacrifice the load-carrying capacity of the heavy off-highway haulers we planned to use in the tunnel work, for the much smaller capacity but direct haul possibilities of on-highway trucks. Secondly, there are certain times of the day when traffic on the roads surrounding the work area is so heavy that truck operations are at least seriously hampered, if not halted entirely. And the road to the disposal area is very 'slippery when wet'—can't be negotiated by the heavy haulers.

"So we decided to use a subcontractor. Under this plan, our 10-yd, overhung rock trucks, which can turn around in less than 19 ft, work continuously from the tunnel heading to a small disposal area stockpile within our working area. They are not affected by weather or traffic conditions. A subcontractor (the Haddock Coal and Contracting Co., of Crafton, near Pittsburgh) takes out the stockpile without interfering with our own operations."

The five rock-body haulers are fed by a team of two shovel loaders that can run up to the muck pile, load, then throw the load backwards over themselves into the haulers.

• **Blasting**—Employing these machines, MC&S is now biting into the tunnels at the rate of about 32 ft (total for both bores) per day, advancing the easterly of the two tunnels some distances ahead of the one on the west.

The jumbo cuts an average of 110 holes per round, in a circular pattern designed to cut out the full 32 ft 10 in. excavated width of the horseshoe-shaped tubes. Holes are drilled to depths of 10 ft, loaded with 3 lb of gelatin blasting agent per cu yd of rock obtained. Average shot—with standard delay caps—produces about 248 cu yd of stone, well broken in most cases, because of its character.

Compressed air for the drills is supplied by two 1,750 cfs compressors housed in an aluminum-sided shed in the portal area. In addition to this supply, a total of 100,000 cfs of air is being pumped into the two headings to provide livable working conditions for the "around-the-clock," six-day-per-week working schedule. This is supplied by a series of five fans, each powered by a 75 hp motor, pumping through 30 in. conduits form the portal. Three of the pumps are set up in the portal, two others are placed as pick-up units inside the two tubes.

As the tunnelling goes forward, the roof and sides of the newly cut tubes are shored by steel members consisting of

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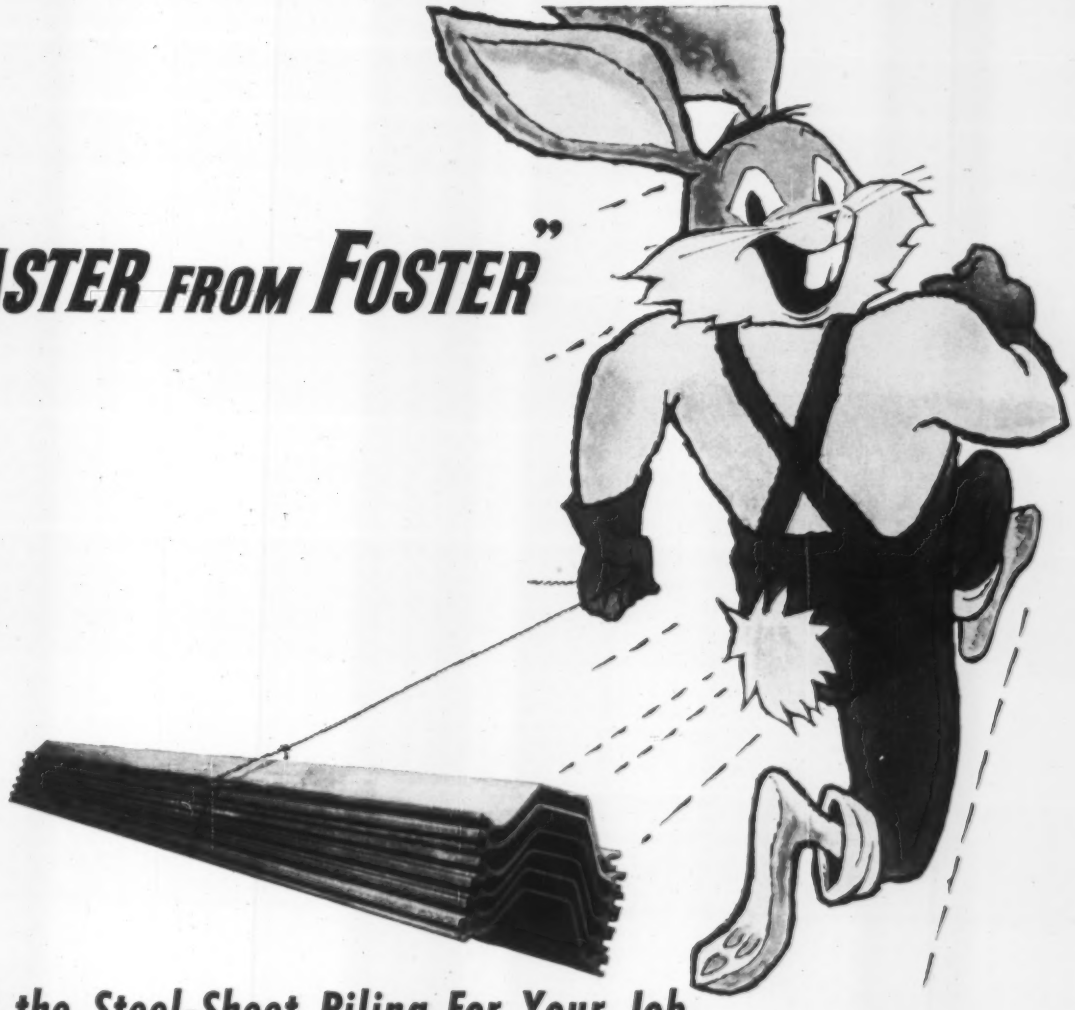

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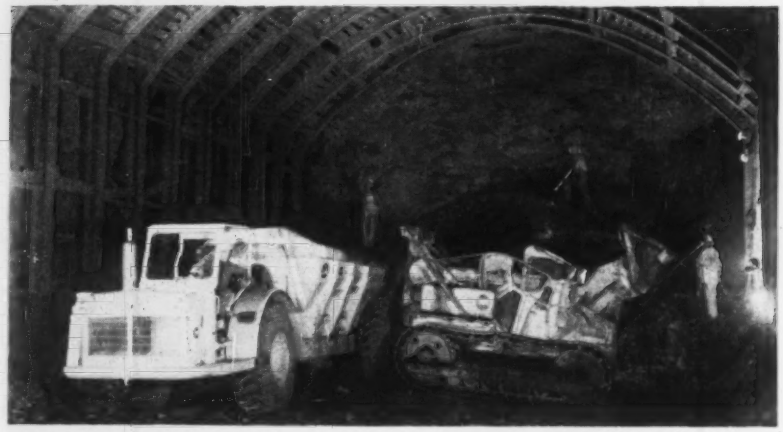
. . . Cross passages connect twin bores



TIGHT QUARTERS inside tube call for machines that can turn around on short radius, or needn't turn around at all—as overhead-discharge shovel loader.

31 lb 8 in. steel H beams at the sides and arched 40 lb, 8 in. members for the roof. These post and arch assemblies are set on 4 ft center, and the spaces between them filled with steel channel lagging. Some 4,000 tons of steel will go into this use.

• **Public relations**—A sidelight of the blasting is that there has been little evidence of annoyance, damage—or bad feeling—to residents of properties that surround and are in some cases directly above the blasting areas.

This is partially due, engineers believe, to the composition of the hill itself. According to borings, the strata from the top of the hill (1,130 ft above sea level) run from clay to weathered shale; to sandy and broken shale; down to gray and red shale and sandstone; then blue shale and limestone, and back to gray shale at the tunnel line (elevation of about 780 ft). Some of the lessened effect, it is believed, may also be caused by an abandoned coal mine, paralleling part of the tunnel alignment, about 100 ft under the hilltop. Engineers believe that open spaces in this old mine may also act to damp out some of the shock of the blast.

Another factor has been a careful public relations program carried out for the benefit of residents and property owners. A survey was made of every structure on and adjoining the center line of the proposed tunnel—and the inspectors were not only instructed to determine the condition of the structures for reference in possible future damage suits, but to explain to owners and residents exactly what would be happening during construction, why, and what precautions would be taken.

In addition, Irwin keeps an "open door" policy for all residents of the area, inviting them to contact him immediately if they have any complaints, damages or desire for information. And he makes a point of seeing to it that such complaints or requests are promptly and courteously handled.

MC&S has a total of 224,000 cu yd of rock to remove from the tunnels themselves. Under a subcontract, Latrobe Construction Co. of Latrobe, Pa., has already removed 320,000 cu yd from the south portal to clear the working area, and is now removing the first of some 86,000 cu yd at the north portal.

• **Tube design**—Designed for the Pennsylvania Department of Highways by the Rochester, Pa., consulting firm of Michael Baker, Jr., Inc., the Fort Pitt Tunnel will consist of two tubes, the southbound tube being 3,432.8 ft in length, northbound tube 3,437.8 ft.

The tunnels will be 32 ft 10 in. excavated width at the line of the floor slab, with a finished width at this point of 29 ft 4 in. Each will carry two 12 ft roadways, with a 2 ft 9 in. sidewalk and a 1 ft 6 in. wide curb at one side, a 1 ft 7 in. curb at the other.

Clear height to the hung ceiling will be 14 ft, with the space above the ceiling being used as an air duct. The ceiling itself will be 5½ in. thick, except around the center hanger. The roadway base will be a 1 ft layer of stone, a layer of waterproofing paper, overlain with a 10-in. reinforced concrete slab. Wearing surface will be of brick.

Underlying the base stone, in a trench cut in the center of the roadway, will be an 18 in. clay pipe drainage line, fed by 6 in. clay pipe laterals at 50 ft centers.

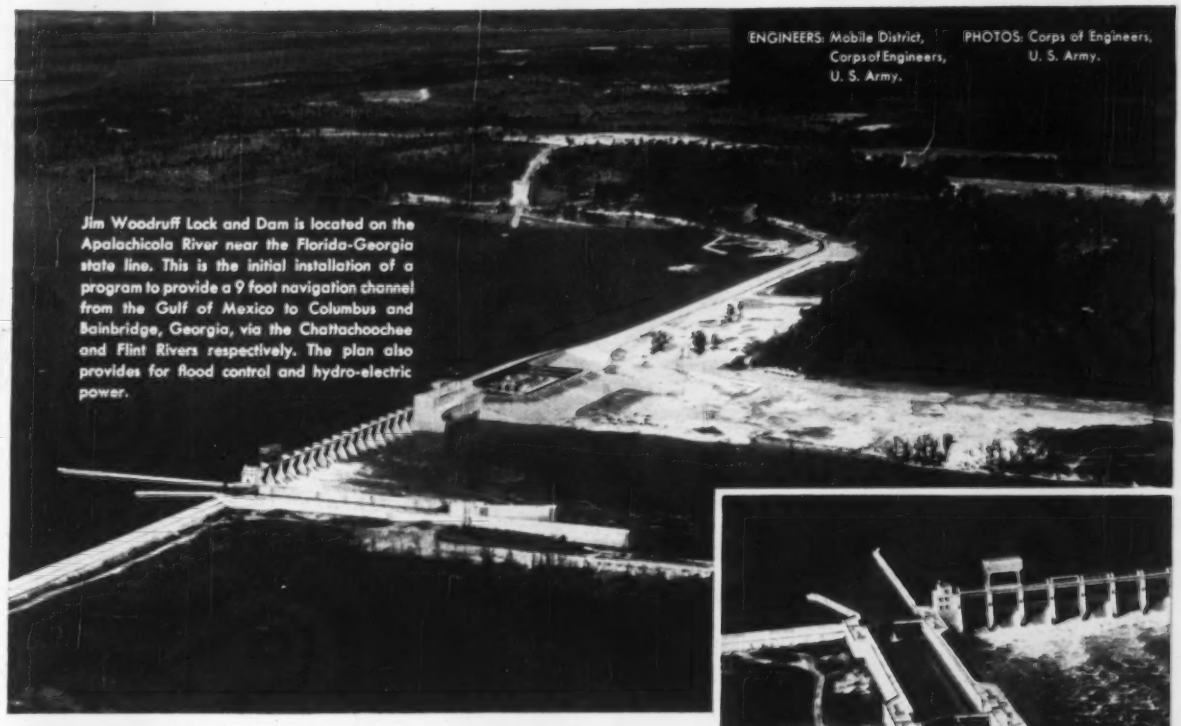
The twin tunnels will be 60 ft apart (centerline to centerline) for their full length. Seven cross-passages, with an average section of 6 ft 8 in. by 4 ft 5 in. will connect the two tubes, for service and repair. The most northerly of these passages will include stairs to account for the difference in elevation of the two tubes.

In order to account for the rise in pavement level, the southbound tunnel will rise from the south portal on a 1% grade, to a point about 600 ft from the north portal. At this point, it will follow a 2.02% downgrade until it reaches the river's edge. The northbound tube will have a steady 1% grade, from south to north end, for its full length.

• **History**—Originally planned as an authority-built, toll-financed project, the Fort Pitt Tunnel was taken over by the Pennsylvania highways bureau in 1956, to be built as a free facility and to become part of the national interstate highway system.

George Heinitsh, formerly chief engineer for the now-defunct tunnel commission is now special assistant to the Chief Engineer of the highway department in charge of the project. A. E. Cornell is project engineer for Michael Baker, Jr., Inc.; and James Sullivan is Mr. Irwin's assistant project manager for the contractor.

NORTH END of twin tunnels will break through nearly sheer cliff face on river bank, above mainline railroad tracks, connect with double-deck bridge.



ENGINEERS: Mobile District, Corps of Engineers, U. S. Army.

PHOTOS: Corps of Engineers, U. S. Army.

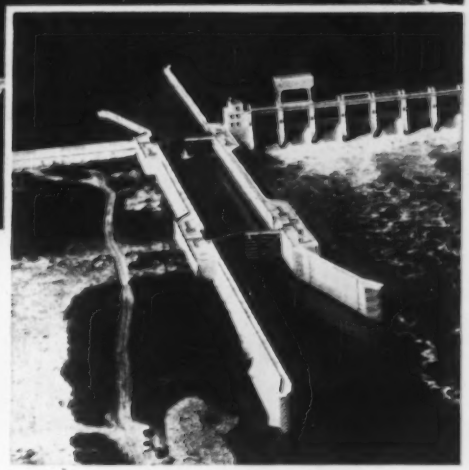
Jim Woodruff Lock and Dam is located on the Apalachicola River near the Florida-Georgia state line. This is the initial installation of a program to provide a 9 foot navigation channel from the Gulf of Mexico to Columbus and Bainbridge, Georgia, via the Chattahoochee and Flint Rivers respectively. The plan also provides for flood control and hydro-electric power.

Intrusion grouting eases construction problems at Jim Woodruff Dam

The Jim Woodruff Lock and Dam Project, recently completed under the supervision of the U. S. Army Corps of Engineers, is a typical example of how effectively INTRUSION* grout can control sub-surface water. Investigation at the dam site indicated a layer of water-bearing Tampa limestone under the entire area. Army Engineers determined that extensive grouting would be necessary to prevent seepage under the dam, to increase load bearing capacities, and to hold excessive water out of excavations.

The excavation for the lock was to go 30 feet below normal river level. As material was removed to form a cofferdam, the lock area was surrounded with a temporary curtain of sanded INTRUSION grout for a total perimeter distance of some 2800 lineal feet. Grouting was not intended to stop leakage into the cofferdam but only to reduce it to a volume that could easily be handled by pumping. When excavation exposed the Tampa limestone layer, only minor seepage was evident. Even when a flood raised the river level another ten feet, the increase in water flow was very slight.

INTRUSION grout was also used under the fixed crest spillway, (large photo—left) and the gated spillway and power house, (center) to increase load bearing and to seal the permeable limestone. When lock construction was completed, a grout curtain was placed around it to minimize uplift pressures.



Usable lock area measures 82 x 450 feet. Maximum lift is 33 feet.

Cofferdam grouting held seepage into lock construction area to minimum. Primary grout holes were drilled on 20 foot centers. Secondary holes halfway between primaries showed Intrusion grout had penetrated limestone voids for a 10 foot radius around initial holes.

Information on the control of sub-surface water by INTRUSION grouting and other unique I-P methods can be obtained by contacting INTRUSION-PREPAKT, INC., 568-K Union Commerce Bldg., Cleveland 14, Ohio. In Canada: INTRUSION-PREPAKT, LTD., 159 Bay Street, Toronto, Ontario.

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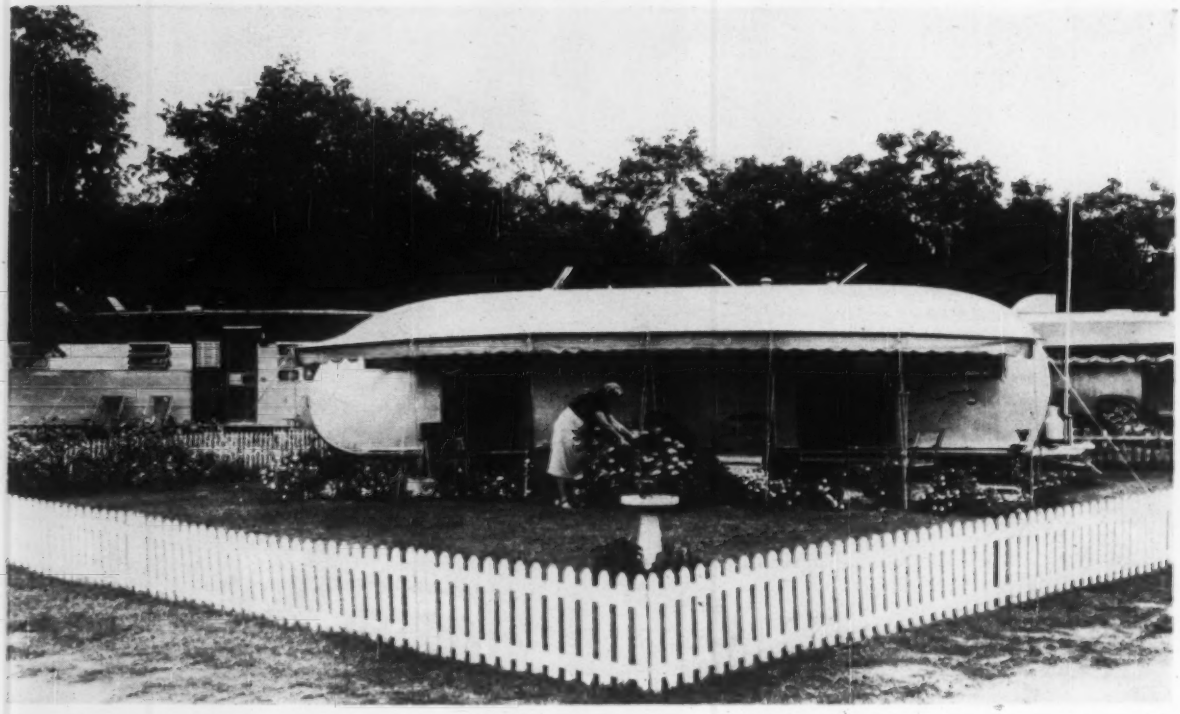


Homebuilders are challenged by a new competitor . . .

Mobilehomes—Low Cost Family Shelter

Robert J. Stinson
Assistant Editor

The homebuilding industry is taking a long, hard look at what it believes to be its most dangerous competitor for the consumer's dollar—the automobile. But at the same time it is ignoring other competitors who are invading housing directly—the mobilehome manufacturers.

In practical terms, the mobilehome manufacturer is potentially a greater threat to a homebuilder than the car manufacturer. The buyer of a new car who finances the purchase is generally knocked out of new-home ownership because the monthly carrying charges for the car claim a large amount of his "take home" pay. A lending institution's mortgage officer takes one look at that prior debt and firmly says "no" to the would-be homeowner. Because of this, the entire housing industry aggressively pushes the idea of "buy your home first," pointing out that although a new car purchase can prevent a home purchase, the reverse usually does not hold true. The home buyer rarely has difficulty in financing a new car; in fact, it sometimes is made easier by being a homeowner.

But, without a word or a countermove, the homebuilding industry (including the manufacturers of prefabricated houses) is allowing the mobilehome producers to carve out for themselves a large chunk of the business that builders feel is exclusively theirs—providing shelter for America's families.

This lack of awareness on the part of the homebuilding industry perhaps is understandable. Involved since World War II in a boom that saw houses snapped up as fast as new developments were announced, and many times faced with legislative and mortgage market crises, builders were not likely to notice the growth of a different but parallel industry.

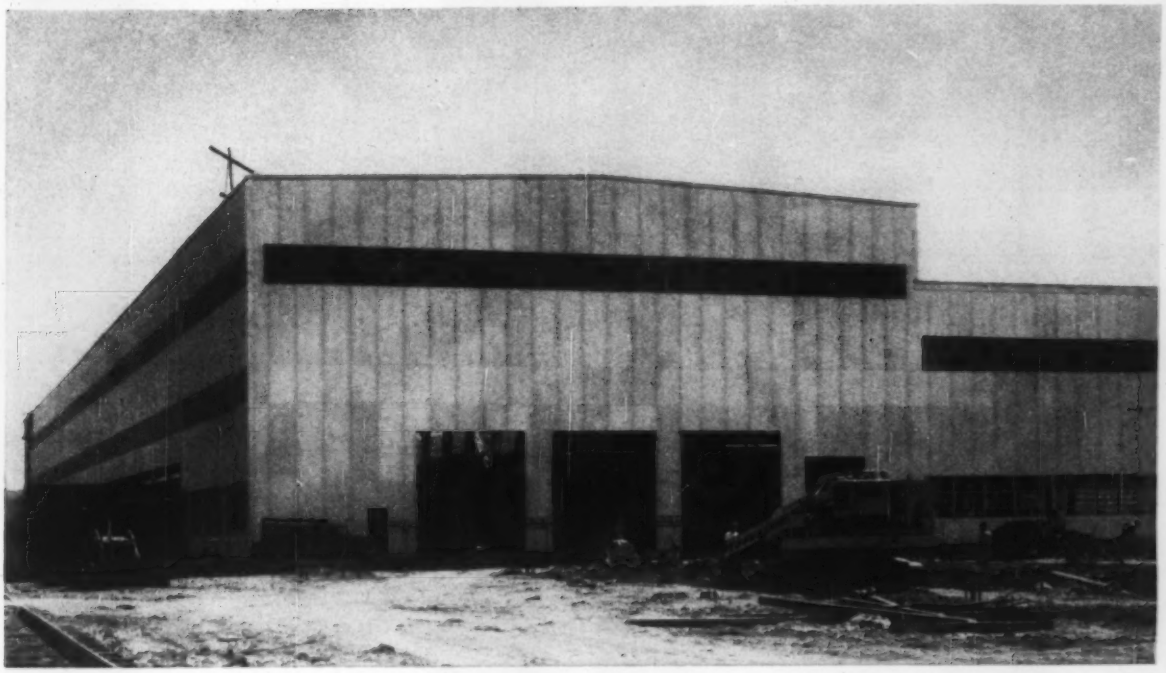
The manufacturers of the houses on wheels have come a long way from the day when their product was just something to hook on the back of a car and be bounced over country roads during a two-week camping trip. In fact, the industry has been bothered by a problem similar to that of the prefabricated home manufacturers. The latter had to overcome the derogatory "Oh, it's a prefab" exclamation that automatically carried with it the connotation of a cheap house of poor quality having no style. The other group had to wipe out the words "trailer" and "trailer camp" and the unfavorable mental picture they inspired.

• **New look, new name**—To reach that goal, the industry had to develop a radically different article with respect to quality and comfort, but a product that still could be hitched to the back of a car and rolled on its own wheels. Like the prefabricated home manufacturers whose current product often has style, comfort and quality, the house-on-wheels group worked to develop a product with the same salable and desirable attributes.

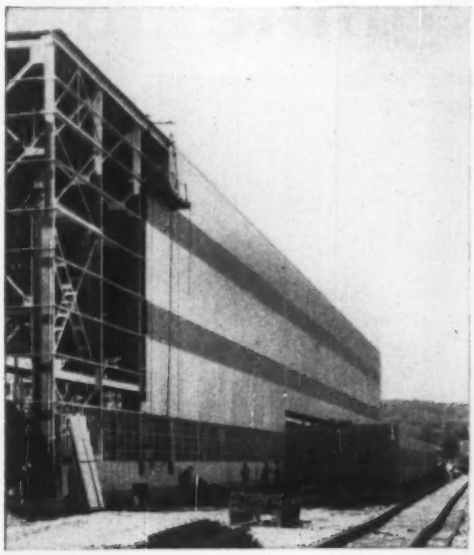
But, unlike the prefabricated home industry, it also came up with a new word that succinctly described the article while simultaneously eliminating earlier unfavorable connotations. The new word is "mobilehome." Through vigorous merchandising and the habit of individuals in the mobilehome industry to correct a person who refers to their product as a "trailer," the new word now is fighting for a position in the latest dictionaries.

The mobilehome also found its way to popularity with a large segment of the nation's population, and captured a larger share of the new house market than the prefabricated homes industry.

• **Year-by-year growth**—In 1954, private housing starts totaled 1.2 million. Of that total, 6.4% or 77,000 units were prefabricated, according to the Prefabricated Home Manufacturers Institute. In that same year, the mobile-



Aluminum siding selected after engineers compared costs



Building: Erie Railroad, Car Repair Shop, Meadville, Pennsylvania
Consultant: Osborn Engineering Company, Cleveland, Ohio
General Contractor: Hughes-Foulkrod Company, Philadelphia, Pennsylvania
Aluminum Subcontractor: Elwin G. Smith & Company, Inc., Pittsburgh, Pennsylvania

THEN THEY PUT 100,000 SQUARE FEET INTO THE NEW ERIE RAILROAD SHOP!

Alcoa® Aluminum was selected for Erie Railroad's new Meadville, Pennsylvania shop after engineers took a close look at costs. When they made comparisons with protected metal and stainless steel, they found first cost was lower with aluminum.

In addition, aluminum's resistance to smoke, fumes and grime guarantees many more years of maintenance-free service. It won't rust, rot, shatter or warp. Protective painting will never be needed. The embossed surface of the siding gives it natural attractiveness.

Where Erie required extra insulation—in the machine shop, lumber mill, paint shop and storeroom—aluminum sandwich wall filled the bill. Its glass fiber core will keep these rooms dryer, make them easier and cheaper to heat and cool. And rust-free aluminum gutters, downspouts, sash, coping and gravel stops will save Erie many more dollars in upkeep.

To get savings like these for your clients, specify siding or sandwich wall of Alcoa Aluminum. Complete data available from your nearest Alcoa sales office or Alcoa Approved Applicator. Or write Aluminum Company of America, 860-A Alcoa Building, Pittsburgh 19, Pennsylvania.

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"Our 33 Macks are the main reason why we are able to give our ready-mix customers the best possible service at the least possible cost," says Mr. Grover Whitley, president of Whitley Construction Co. of Decatur, Georgia. Adds Mr. Whitley, "The extra strength and low maintenance built into

Macks have significantly

Whitley has eight of these 4-wheel Macks with 4-yard mixers for use on its smaller jobs, such as this residential construction. These Macks perform so economically and stand up to wear so well that Whitley has four more on order.

Two of Whitley's 25 Mack 6-wheelers pouring concrete at roadway construction site. Each of these Macks carries a 5½-yard mixer. Whitley has found that Macks carry these back-breaking loads with ease and dependability, at minimum operating cost.

reduced operating costs...

"Beating the problem of high operating costs was impossible for us until we bought our eight Mack 4-wheelers with 4-yard mixer bodies," says Mr. Whitley. "In past years, we have used all makes of trucks in the lower price class for use on the smaller jobs, but maintenance and operating costs were excessively high.

"Our business furnishes concrete for residential and commercial construction, which involves our trucks in both heavy city traffic and off-highway travel. Steep grades are frequently encountered, and on foundation pours the terrain is often very rough and the mud deep—conditions which do not make for low-cost operation.

"Yet, with an annual mileage of 30,000 miles (an average of eight trips per day), down time is negligible, maintenance is low, thanks to Macks' superior construction. For profitable operation, these Macks top all our other trucks. In fact. we believe that our reduced costs of operation are due mainly to our use of Macks!"

* * * *

For the large pours, Whitley Construction Co. operates 25 Mack 6-wheeler mixer chassis, again with top operating economy and little down time. The extra strength built into the chassis and sheet metal of all Macks pays dividends in extra years of service that no other truck can equal.

If you are looking for equipment that can substantially reduce your operating costs, let your Mack representative show you why Macks are the cheapest in operation and require the lowest possible maintenance costs. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

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TRUCKS

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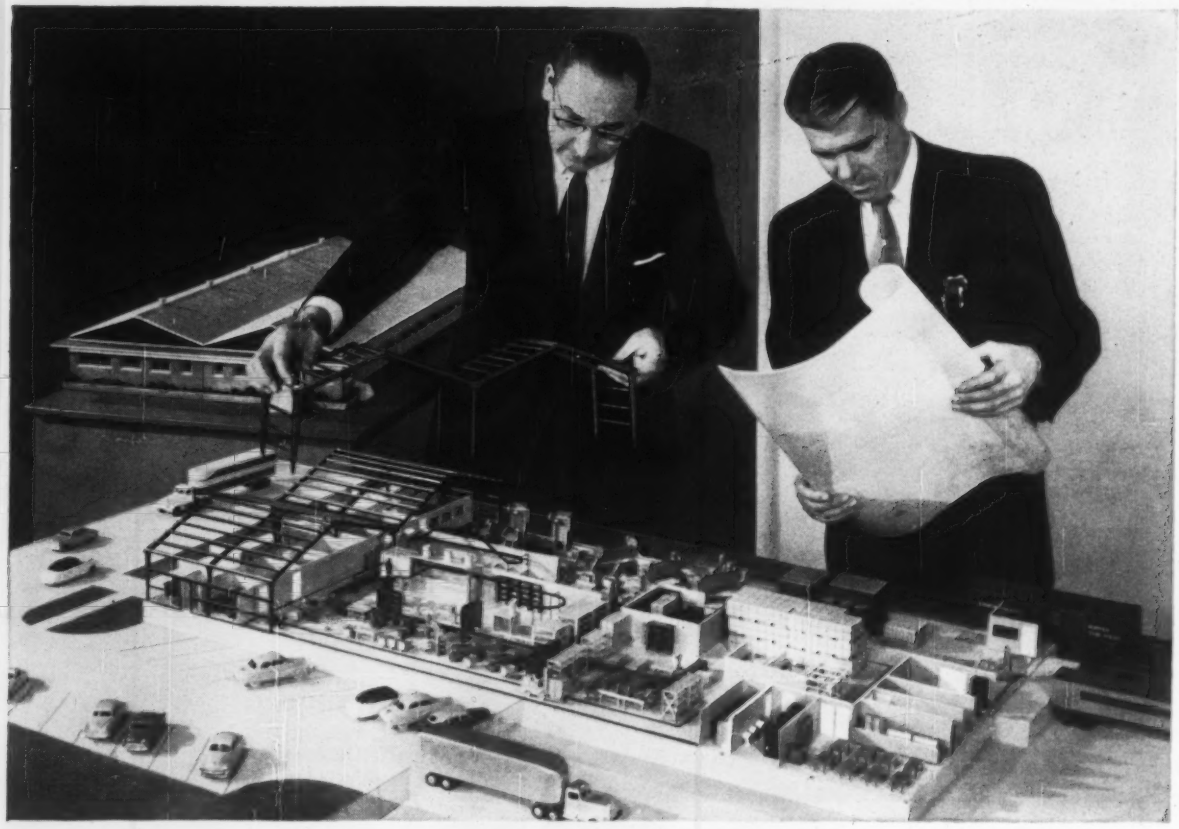

Why engineers are choosing pre-engineered Butler buildings

Engineers are discovering that precision-made, pre-engineered Butler buildings provide a completely standardized, yet flexible system of building. They have discovered that this system enables them to substantially reduce routine engineering time. Being freed from detail work, they have been able to concentrate on planning the over-all facility. Results—they have been able to provide more efficient facilities at lower cost . . . in far less time than traditional construction methods would permit.

The clear-span construction permits wide flexibility in laying out production, materials-storage and finished-stock areas. The truss-free, gable roof not only provides clear, overhead space for the installation of utilities and materials-handling systems, but also ventilates naturally. With the installation of Butler plastic, translucent Lite*Panls, engineers can take advantage of natural daylight for much of their lighting requirements. The weather-tight construction plus vapor-sealed insulation produces a building that is easy and economical to heat or cool, because there is less heat loss than in a traditional masonry building.

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. . . Mobilehomes—a challenge to the homebuilders

homes industry produced 76,054 units, which was equal to 6.3% of 1954's housing starts.

The following year, 1955, when the nation scored a near-record with 1.3 million private housing starts, prefabricated housing units claimed 7.1% of that total with 93,000 units. But the prefabricators were surpassed by the mobilehomers who produced 111,784 units, or 8.5% of housing starts that year.

Then came 1956, when private housing starts of slightly more than 1 million represented a drop of 16.5% from the previous year. The prefabricators more than held their own and, of the housing starts total, 8.7% represented prefabricated houses for a tally of 94,790.

The mobilehome manufacturers, however, jumped their production for that full year by 25% with a total of 139,690 units, which was equal to 12.8% of all private housing starts.

Last year, housing continued its slump and for the full year dropped 11.3% to an estimated 975,000 starts.

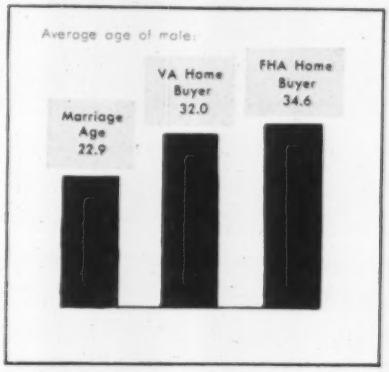
Prefabricators saw their production for the first six months of 1957 decline by 10.4% from 1956's same period to a total of 62,700 units. Their share of the total private market therefore remained under 8%.

However, in the face of the second consecutive year of decline in housing, the mobilehome manufacturers continued to boost their production.

During the first eight months of 1957, they manufactured 94,690 units. This was a 2.8% gain over the same months of 1956. In contrast, private housing starts during the first eight months dropped 11% to 700,500. The combination of boosted mobilehome production and a decline in housing starts served to jump the mobilehomer's comparative share of the private housing market in that period to 13.5%.

• **They move little**—This growth cannot be passed off lightly with the remark, "Mobilehomes serve a group we are not concerned with—people on the move." Builders possibly are being led astray by the name mobilehome and lack of regularly issued government statistics on the subject. Mobilehome could be, for all practical purposes, a misnomer for, according to James C. Downs, Jr., a Chicago real estate and building economist, 75% to 80% of the mobilehomes never more more than 50 miles from the place of purchase. Its only mobility, in most cases, would appear to be that it is bought and then moved to a site where it is placed on blocks or a foundation, rarely to move again.

This same point was more generally recognized by an 11 man group composed of faculty members of MIT and



TIME LAG of 9.1 to 11.7 years between marriage and home purchase jolts builders.

Harvard University who have concluded a study of the nation's housing needs for the American Council to Improve Our Neighborhoods, better known as Action. Working under a $250,000 grant from the Ford Foundation, they also reported that mobilehomes have outsold the "prefabs" year after year, and they added that "the average trailer never moves 100 miles from where it was bought."

The experts, in criticizing the housing industry for what it described as being "almost the last major stronghold of preindustrial craft production," said homebuilders should give more attention to the methods used to produce an "often over-looked competitor—the trailer."

• **Where will newlyweds go?**—Within the last 12 to 18 months, the homebuilding industry glanced over some government statistics. What it saw caused some concern.

From 1952 to 1956, the age of the man at the time of marriage averaged out to 22.9 years. But the age of the male homebuyer under VA financing average 32 years. The average age of the male homebuyer under FHA financing was 34.6 years.

It was a rude shock to the National Association of Home Builders. The group, and some economists had been banking on a fabulous housing boom in the mid-1960's that would stem from a huge surge in new family formations.

But that lag of from 9.1 to 11.7 years between the time of marriage of the male and the time he buys a house suddenly turned the promised housing boom into a mirage.

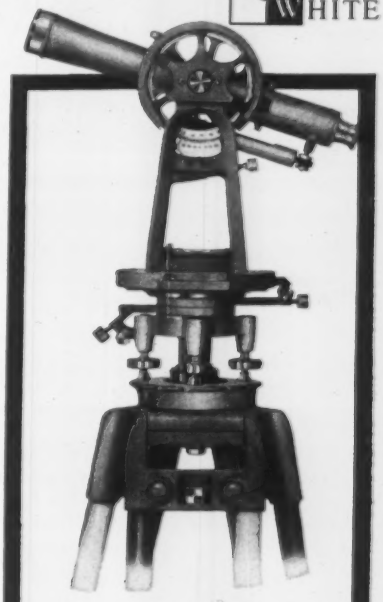
The association took the statistics seriously enough to set up a full-scale promotion campaign within its membership to encourage engaged couples and those just married to save for a down payment on a new house.

This promotion, quietly unveiled at last year's NAHB national convention

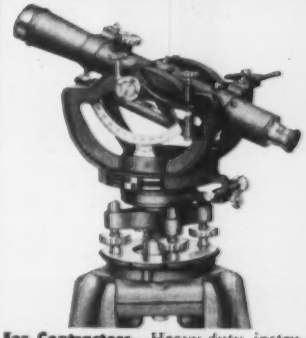
contractors and engineers know

THE SIGHT IS RIGHT

WITH A DAVID WHITE



For Contractors—A brand new, heavy-duty transit designed for fast, accurate surveys in road construction, grading, other major jobs. Only one of its type on the market. Rugged, simplified construction with all the features you need: double centering, revolves 360 degrees for reverse readings, reads to one minute, vertically and horizontally. *T8200 Contractors' Transit* Includes new, American-style, wide-frame tripod. *Retails for **$375.00.**



For Contractors—Heavy-duty instrument for general highway construction, for laying angles, to ascertain slopes, align piers, plumb walls, for tiling, and leveling of floors. *T8300 Universal Builders' Level Transit* Includes new, American-style, wide-frame tripod. *Retails for **$217.00.**

*The T8200 and T8300 may be purchased at 10 per cent down at your blueprinter, or lumber, building supply or hardware dealer. Write today for your free David White surveying instrument catalog.

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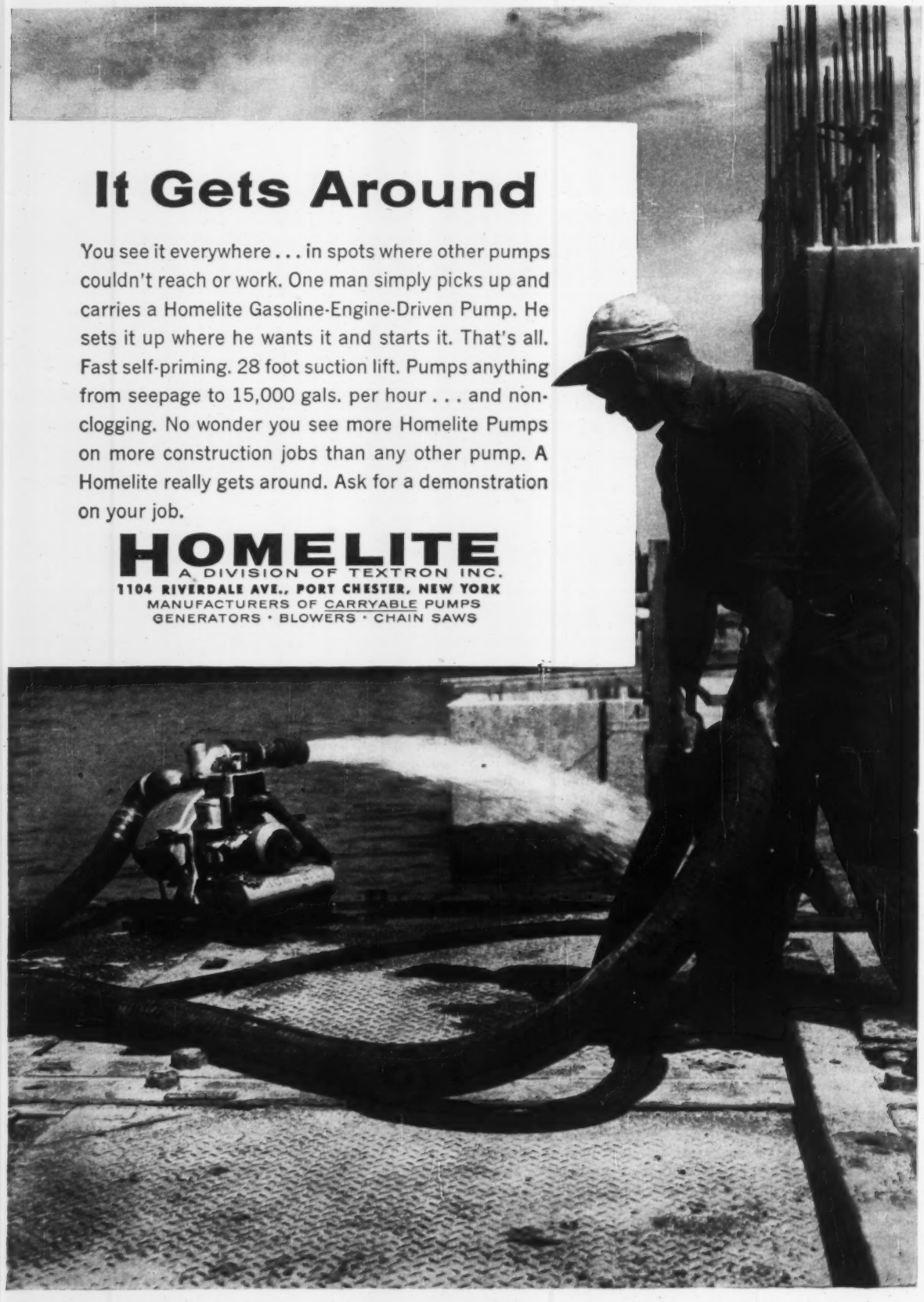

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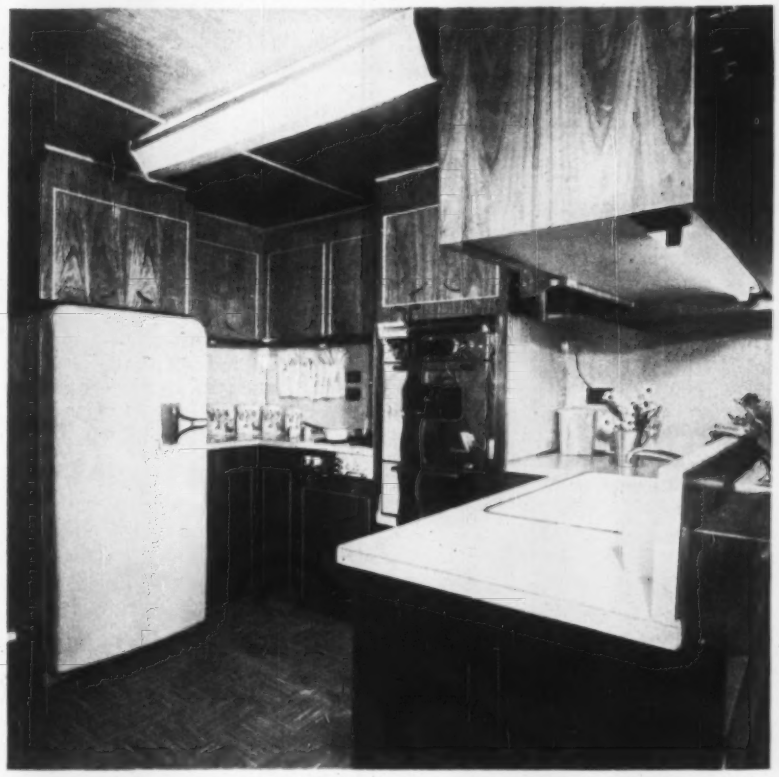
. . . Mobilehomes—a challenge to the homebuilders



ALL THIS and furniture too is included in the purchase price of mobilehome. Major appliances are of the latest design as can be seen in this mobilehome kitchen.

in Chicago, also urged the members to embark on a program of building low-cost homes with as few as four rooms. This type of house was offered as the type of product most suitable for the newly married couple, and also retired couples.

But if the homebuilders wondered where the bridegroom went between the time he married and the time he bought a house, the mobilehome manufacturers and dealers had a partial answer. Of all mobilehomes sold, 8% to 10% were bought by the newlyweds. And 10% were sold to retired couples.

• **Attractively priced**—There is little doubt that the total cost of a mobilehome is a drawing card. Prices range from $3,000 to $9,000, with the heaviest sales in the $4,500 to $5,000 bracket.

Although the price is low in relation to most of the houses built today, the downpayment is on a par with, and in some cases, more than the downpayment on a house. The cash requirement ranges from 25% to one-third of the sale price with the balance financed over periods running from three to seven years.

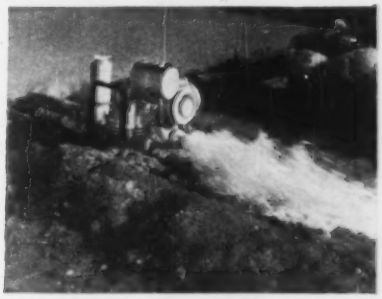
The apparent disadvantage of the fairly steep downpayment is offset by the fact that a buyer can expend most or all of his immediate cash resources on a mobilehome without having the problem of buying and paying for furnishings and major appliances. Both come with the mobilehome and are included in the total price of the unit.

In addition, the compartively low monthly costs of the mobilehome beckon to the lower income groups. The monthly rental for a site in a mobilehome park ranges from $20 to $50, although there are rare exceptions to this general rule. The exceptions see the charge soaring to $200 a month or more, but these are for luxurious accommodations in some sections of California. This point, however, does point up the fact that mobilehomes and mobilehome parks can provide the utmost in comfort. They are not a shoddy substitute for conventional housing.

• **Meeting the competition**—Despite the fairly wide lack of attention paid to the mobilehome makers by the homebuilding industry, there are some who have recognized a trend; that is the tendency toward immobility of the mobilehome. This is dramatically emphasized in at least two places—Sarasota Bay, Fla. and Phoenix, Ariz.

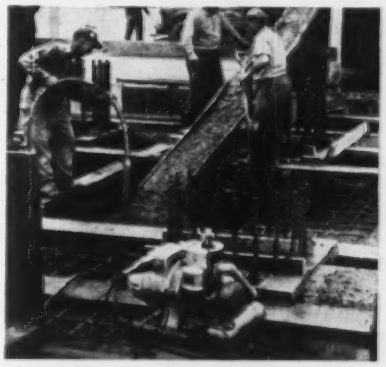
(*Continued on page 48*)

Full Line of Carryable Construction Equipment Now Offered by Homelite



Carryable Diaphragm Pump . . . This self-priming, 120 pound diaphragm pump will handle water in the thickest sand, muck, or mud. Capacity: 5,000 g.p.h. Size: 3". Complete line of centrifugal pumps are also available in sizes from 1½" to 3".

Chain Saws For Every Job . . . Now you can choose from a full line of lightweight, powerful Homelite chain saws. From 3½ to 7 horsepower . . . 19 to 29 pounds. Brush cutting and clearing attachments are available to handle all your cutting jobs.



One-Man Electric Vibrator . . . It takes only one man to place concrete with powerful, Homelite high-cycle or universal electric concrete vibrators. Carryable Homelite generator provides power for high-cycle vibrators *and* 110 volt DC for all universal vibrators, tools and floodlights.

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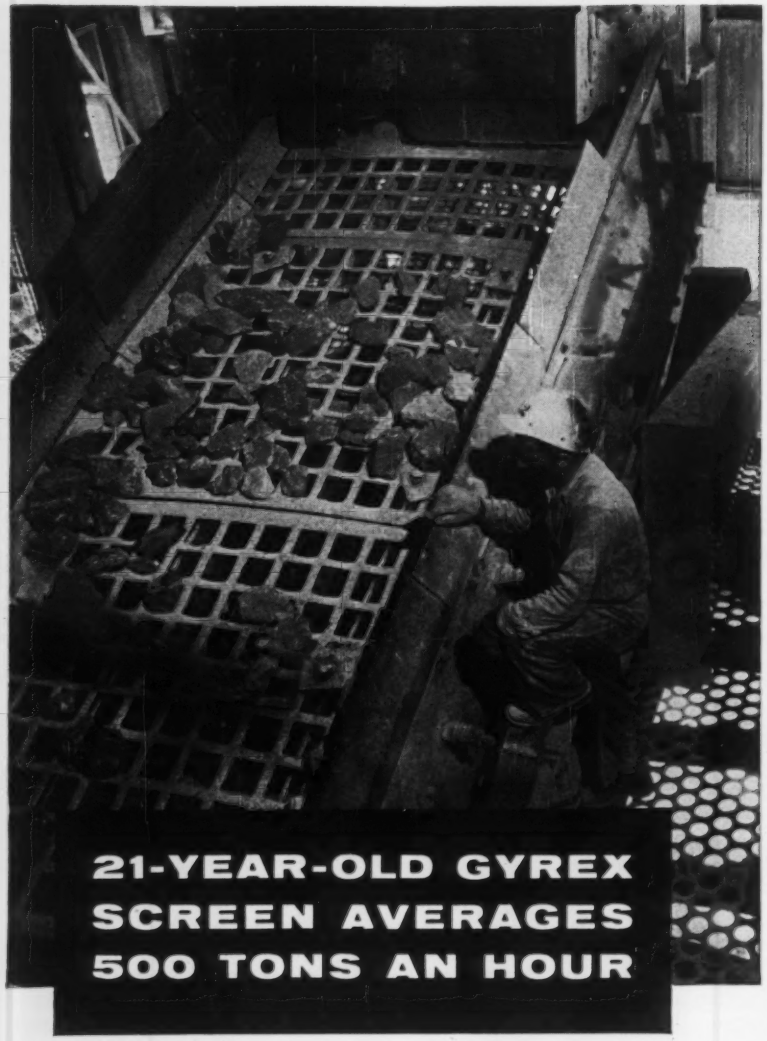

The Marble Cliff Quarries Company, Columbus, Ohio, separates 500 tons of stone an hour on a Hewitt-Robins Screen. This double-deck Gyrex vibrating unit was installed in 1936 and still has its original eccentric bearings. Main bearings were replaced only once—in 1953 after 17 years of use.

The low upkeep, design flexibility, and high over-the-years productivity of this H-R unit led Marble Cliff Quarries to install a second screen of identical capacity in 1948. And today both units still operate nine hours a day. To find out how H-R products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Connecticut.

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. . . Mobilehome—challenge

At Sarasota Bay, located between Sarasota and Bradenton, mobilehome sites are being sold, rather than rented. Approximately 160 acres have been divided into 1,500 mobilehome sites, each 40 ft by 60 ft. The property owner, Gulf Development Corp., has installed sewer and water systems.

In Phoenix, a developer is constructing a park that combines mobilehomes with conventional construction. In this case, 33 acres contain 230 mobilehome sites which rent for $550 annually. The living unit is provided by the tenant who then constructs permanent additions around the mobilehome. These facilities include living room with fireplace, patio, porches, utility room, carport or recreational area. Prices for the additions range from $2,500 to $10,000.

• **Return to low cost house**—Although builders and prefab manufacturers are failing to notice the mobilehome competition, they have recently expressed renewed interest in low cost housing. A return to the mass production of such structures could serve to reduce the swift inroads the mobilehomers have been cutting in the housing field, for their greatest growth occurred during a period when homebuilders had become almost contemptuous of minimum-price-range shelter.

In the boom years, the homebuilding industry generally seemed convinced that the public had unlimited resources and was demanding bigger and more expensive houses. To some extent the latter was true, but in the rush by the homebuilders to "upgrade" their product the families on the low end of the middle income bracket were almost entirely forgotten. Housing costs soared, shutting out the small wage earner.

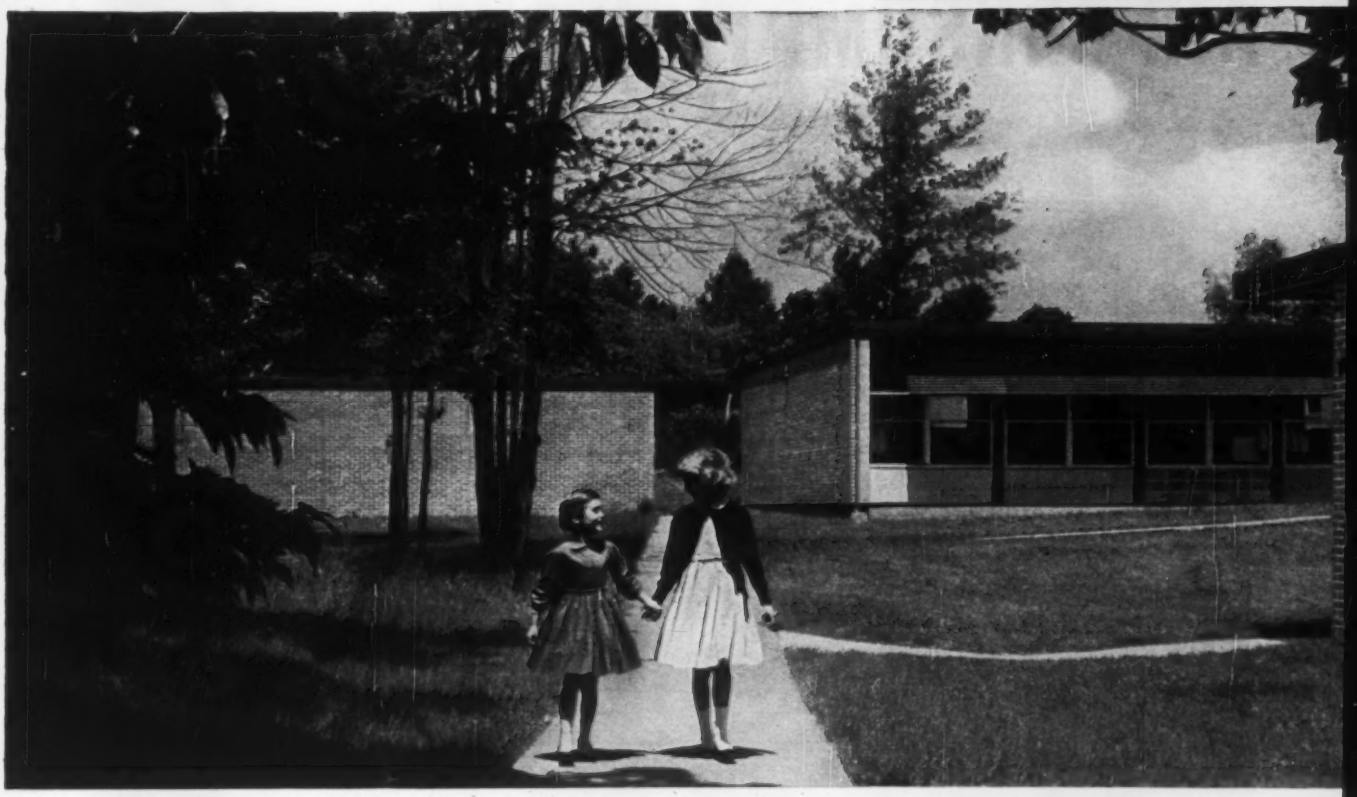
Now, with the swift turn in the market, many builders have announced their intention to return to the field where the market is biggest—the low cost house. This was brought out in a survey by NAHB of 400 builders. Those questioned built 26,000 houses in 1957 and planned to raise production to 30,000 this year. But they also expected that their production of homes in the $10,000 to $12,500 bracket would be stepped up by 45%, while construction of houses in the $15,000 to $17,000 class would be lowered by 5%.

Although low price is the obvious answer to meeting the competition, the more complex and true solution to low price is increased productivity and developing methods by which this can be accomplished.

How one builder has accepted the challenge and made great strides toward boosting productivity is described in the article that follows on page 52.

HOLLOW TREE SCHOOL

DARIEN, CONNECTICUT



AWARD WINNER - *1955 Top Award "The School Executive"*

"A part of the requirement for this school was 'deliberately to avoid any expenditures not related immediately to the educational program.' In our opinion, the steel framing which was used materially contributed to the economy achieved as well as to visual success of the buildings.

"An aspect of unity on uneven terrain was accomplished through simple, repetitive steel framing of constant spacing throughout the design. Variation from building to building of color on the exposed steel joists lends gaiety and identification to the 'home' of each age group. The children and teachers make continual use of the steel joists for suspending art work or decorations of the season in classrooms. As designers, we have a high regard for the versatility of structural steel."

General Contractor:
Sam Grasso Co., Inc.

Structural Engineers:
Severud, Elstad, Krueger

Steel Fabricator:
Port Chester Iron Works

Structural Shapes:
Bethlehem Steel Company

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DRILLING TIME CUT 71%

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Quarry: Shelbina Quarry of HALL & RILEY QUARRIES and CONSTRUCTION COMPANY, Boonville, Missouri

Formation: Burlington formation . . . fitchery with flint seams . . . hard to break

Equipment: One Gardner-Denver deluxe "Air Trac"® • One DH123 deep hole drill • Ring seal shank • Sectional drill rods • Couplings • 2¾" carbide bits

Plan for Demonstration: 7′ x 10′ spacing • 24′ hole depth • Number of holes—36 • Tons in shot—4500 • Holes loaded with 60% dynamite below water level and ammonium nitrate above

HERE'S A DETAILED REPORT ON DEMONSTRATED SAVINGS

	"AIR TRAC" DEMONSTRATION	WAGON DRILLS FORMERLY USED	SAVINGS
Tons in shot	4500	4500	
Number of drills	1	2	1
Spacing	7′ x 10′	4′ x 7′	
Hole size	2¾"	2¼"	
Tons per foot	5.4	2.16	
Number of holes required	36	90	54
Lineal feet drilled	864	2160	1296
Time required to drill out	10½ hrs.	18 hrs. each drill	25½ hrs.
Pounds of explosives	1675	1800	
Cost per pound	15.6¢	20.5¢	4.9¢
Ton of rock per pound	2.7	2.5	
Cost explosive per ton	5.8	8.2	2.4
Powder cost	$262.62	$369.00	$108.00
Drillers required	1	2	1
Drill labor cost	$15.75	$38.25	$22.50
Compressor hours	10½	18	7½
Average air consumption per foot of hole	200 cfm.	200 cfm.	
Total air used	172,800 cu. ft.	432,000 cu. ft.	259,200 cu. ft.
Full load time on compressor	4.8 hrs.	12 hrs.	7.2 hrs.
Compressor fuel consumption (based on 10 gal. per hr.)	48 gal.	120 gal.	72 gal.
Fuel savings on 4500 tons			$10.80

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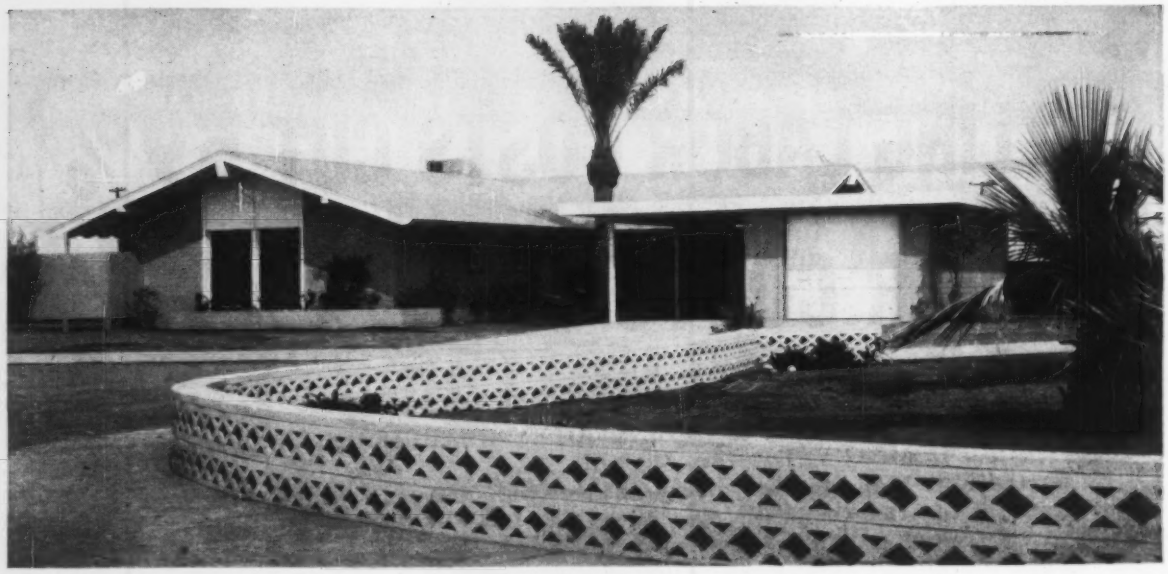


To compete in the low-priced housing field one builder offers . . .

Bigger and Better Homes for Less Money

To reach the relatively untapped market for good, low-priced housing, John F. Long, Phoenix, Ariz., homebuilder has adapted assembly-line procedures to house construction. As a result, it is quite probable that Long is offering more house per dollar than any other builder in the country.

One of John Long's homes is a three-bedroom, two-bathroom model with 1,338 sq ft of living space that sells for $8,295. Another is a four-bedroom, two-bath unit with 1,863 sq ft of living area that can be bought for $10,995. The 52 different models offered range from the $8,295 figure up to $21,500 and include the one shown above which sells for $17,450. For an additional $1,700 any purchaser of a Long home can get a 14 x 24 ft swimming pool, complete with diving board, filter system and underwater lighting.

And these one-story houses are not of meager construction. Slab floors, placed just above grade, are finished with vinyl tile. All exterior walls are made of hollow, lightweight, pumice brick. Glass is used in abundance, and many houses have built-in storage walls, shelves, and cabinets. Electric ranges and ovens are standard equipment in all models and include lighted ventilator hoods and exhaust fans.

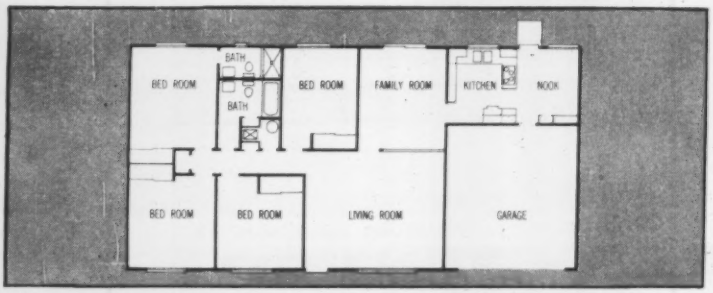
In his 4,000 acre Maryvale development in suburban Phoenix, Mr. Long intends to build more than 10,000 homes—and he is well on his way to it. In 1956, he sold 1,021 homes (65 more than were started in the entire city of Phoenix), and in 1957 his total was 1,787.

• **How to keep costs down**—Success is based on keen cost analysis, mass buying, easy financing, good design, specialization of labor, mechanization wherever possible, and complete control over every phase of construction. Except for the plumbing, wiring and duct installation, nothing is subcontracted. Builder Long, with his own forces, does everything that is to be done, from preliminary engineering (including the layout of streets and sewers) to the final landscaping and planting of shrubbery.

Waste is virtually nonexistent in the Maryvale operations. "If we could figure a use for the sawdust from the

A Man With a Plan

JOHN F. LONG, 37 year old Phoenix, Arizona homebuilder (right, with two-way radio speaker) is a man with a mission—to provide as much house for as little money as possible—and just as fast as he can. His 750 man organization turned out just under 1,800 homes in 1957, and he expects to exceed that figure for 1958.



FLOOR PLAN of a Maryvale house selling for $10,995—far below the cost of similar units in other areas.

REAR OF HOUSE is designed to make outdoor living easy. Sliding glass doors open to a patio from living room and bedroom. Many homeowners want private pools, which are optional at $1,700.

ASSEMBLY LINE set up by Long speeds house construction. Above, an unskilled laborer (right center) positions precut lumber for framing so it will be readily available to reduce the handling chores of higher-paid carpenters who follow (second house).

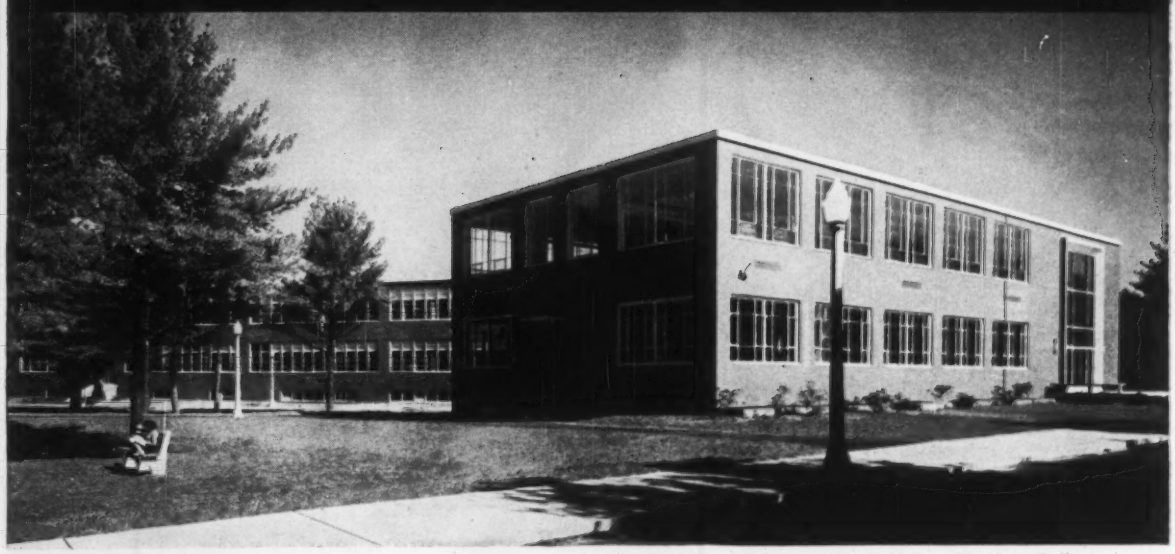
shop, we'd do it," says Mr. Long, whose cost cutting efficiency extends to using the sinkboard cutout as a shelf in another part of the house. (The idea of full utilization is so complete that land awaiting subdivision is farmed so it provides income while being held for construction.)

• **Making the most of skilled labor**—His building methods have been compared to a factory assembly line in which the men move instead of the product. So specialized are the operations, that the concrete footings are placed by one crew (which does nothing else), while the concrete floors are placed by another crew. The wallboard for interior partitions is placed by one group of workmen, while the plasterboard for the ceilings is handled by another. The man who sets the bathtub is not the one who sets the kitchen sink.

Furthermore, no skilled workman handles the materials except during

HIGH FORK LIFT feeds roofing materials to a laborer on the roof, who will place it where it will be convenient for roofers.

"... LEHIGH MORTAR CEMENT gave us a high quality job ..."



Classroom building of the new Westfield State Teachers College, Westfield, Mass.

ARCHITECT: Abbott Associates, Boston, Mass.
CONTRACTOR: Jefferson Construction Co., Cambridge, Mass. and Miami, Fla.
DEALER: Cook Builders Supply Co., West Springfield, Mass.

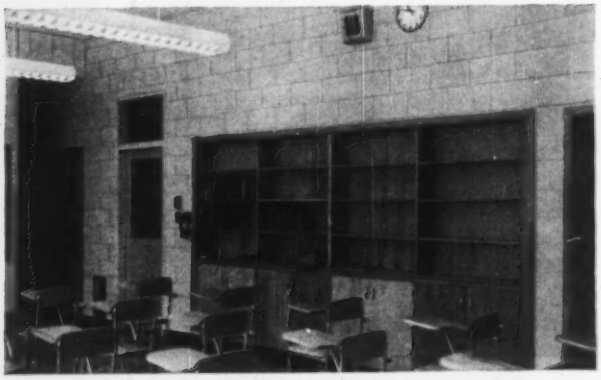
● "We were well satisfied with Lehigh Mortar Cement," wrote Mr. E. C. Connell of the Jefferson Construction Company, on completion of this classroom building.

"We achieved a uniformity of color and texture that was not possible with a cement-lime mixture.

"The workability and plasticity of Lehigh Mortar Cement gave us a high quality job and lowered masonry costs.

"The many compliments we received on the masonry work are due to good masons and to Lehigh Mortar Cement."

Try Lehigh Mortar Cement and see for yourself how it helps produce quality masonry construction.



Typical classroom interior. Lehigh Mortar Cement was used in attractive concrete masonry walls.

Glazed tile and glass block in gymnasium walls were also laid up with Lehigh Mortar Cement.

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LEHIGH PORTLAND CEMENT COMPANY
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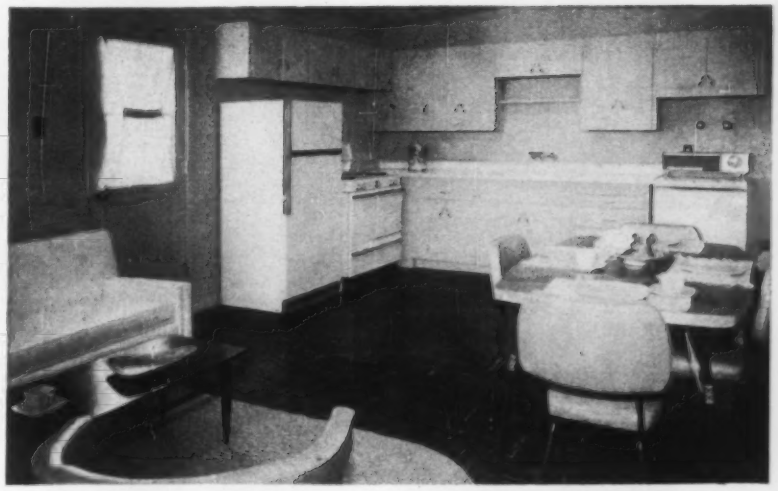
CRASH HELMET, in addition to providing protection, permits worker to hold ceiling board in place with his head, leaving his two hands free for nailing.



COMBINATION KITCHEN and family room, 14 x 23 ft, in the low-priced Balboa, is free of room dividers and provides ample space for cooking, eating, and family activities.

final placement. For example, rafters are precut and on delivery to a house are stacked against the walls at designated locations. The rafters are then hauled into position by laborers, who hold them while the carpenters do only the actual nailing.

Before the roofers begin work, laborers place the proper quantities of roofing materials on specified spots on the roof. In this way, no skilled workman loses time or production by having to go after or wait for materials.

• **Power equipment important**—Machines play an important role in keeping down the cost of Maryvale houses. No job is done by hand if it can be done by machine. The oversized bricks (8x 4x16 in.) used in the construction of all houses are delivered to each site by fork lifts.

Two sets of scaffolding (high and low) are used to keep masons from becoming tired because of unnecessary bending. (Builder Long's bricklayers average better than 1,000 bricks per day, and on one occasion a crew laid up a complete house in two hours and 12 minutes.)

Roofing materials are delivered directly to the house top by high-lift fork trucks. Plasterboard joints are taped by a machine that in a single pass, cements the joint, rolls on the tape and covers it with a second layer of cement. Spackle sprayers shoot a thin layer of plaster onto the plasterboard through hoses hooked to pressure pumps outside the house.

Foremen use two-way radios to order men and materials. Though construction is limited to a relatively small area, the radios save up to 25% of the foremen's time.

In all, this homebuilder has close to $300,000 worth of machines—ranging from power saws to pavers—at Maryvale, and he keeps it moving.

• **Climate helps builder**—It is true that the Arizona climate favors low-cost housing, foundations need not be deep, houses can be built on concrete slabs, and walls can be of a single thickness (8 in.) of brick. It is also true that Phoenix is rated as the third lowest cost city for construction in the country.

But Mr. Long's units are price-tagged at better than $1,000 under the standard Phoenix market. He makes $250 per house and depends on volume —and hard work—to keep ahead of the field. (Long maintains that an early alarm clock is the most important tool for success—and to prove it he gets on the job at 5:30 every morning.)

In an area where the weather is particularly suited to outdoor living, he makes the most of it by bringing the outdoors inside—or vice versa. In any event, all the houses in Maryvale have an air of spaciousness. In the bigger structures, this is achieved by large expanses of glass windows and by sliding glass doors opening directly onto patios or garden areas. In the smaller houses, where price and size are limiting factors, roominess is gained by the use of three-quarter walls and by the inclusion of large unobstructed living areas. Combination kitchen and family rooms (measuring more than 14x23 ft) are found in even the lowest priced houses, and in the $20,000 class, living rooms are more than 28 ft long.

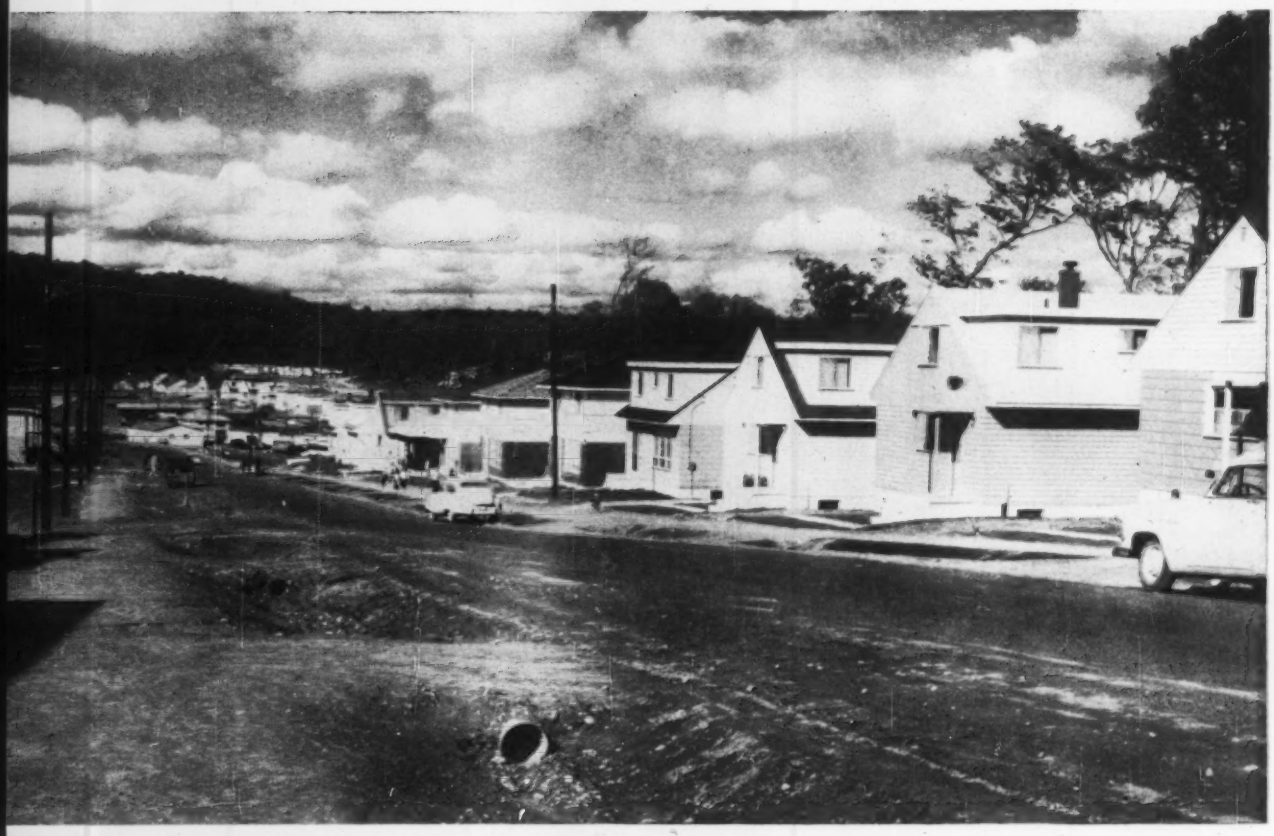
• **Builder is a "loner."** John Long has no partners other than his wife, Mary (for whom his development is named), and no financial help other than bank loans. His spectacular career began in 1947, when with little more than a saw and a hammer, he and Mary set out to build themselves a home. Before the job was finished a buyer made a profitable offer, which they decided to accept. So they never moved in, but started another home for themselves. This story was repeated seven times before the Longs owned their own home.

In the meantime, the experience gained was becoming the basis for the mass-production methods now so effectively utilized. In 1949, John Long decided that homebuilding was his calling so with a crew of five men he began work on a 30 unit project—and he has been building homes ever since.

Most of his growth has been since 1953 when he adopted Title II (FHA section 213) financing. The paper work involved with this type of financing is tremendous, but the results seem to warrant it. A $10,995 house can be bought for $595 down with subsequent monthly payments of $90 covering principal, interest, taxes and insurance. A veteran eligible for Arizona's tax exemptions can reduce the payments by $12 per month.

Merchandising is another Long strong point. He uses salesmanship to the utmost. Each year he sponsors a Futurama and by actually setting up a small community of current models, he displays his products to their best advantage.

So successful was his 1957 show that $800,000 in sales was made during the first two days. Sales in the next three weeks accounted for 253 houses worth almost $3 million.



City in the wilds built from scratch, it's . . .

Canada's Booming Uranium Metropolis

The usual pattern for frontier mining developments is one where little concern is shown for the living facilities of miners and their families. The result has ranged from low-standard dwellings in ill-planned communities to a hit-or-miss assortment of jerry-built dwellings destined to become shack towns, or even ghost towns.

But just the opposite is true at Canada's newest and biggest uranium mining development in the heart of Ontario's "Blind River" uranium belt about 100 miles east of Sault Ste Marie and 20 miles north of the Trans-Canada Highway 17 connecting Sudbury and The Soo.

Starting from scratch only about three years ago, "Elliot Lake"—named after the lake on which it was located—has boomed from a population of less than 500 to over 15,000. By the end of this year its population will exceed 20,000 and by 1960 it is expected to reach 27,000 according to its master plan of development.

The impetus of this "crash" program of homebuilding was generated by the tremendous uranium mining operations in that area. Eleven uranium mines with their huge concentrator mills, located within a 20 mile radius of Elliot Lake, are being developed at a total estimated capital expenditure of $265 million. They will have a total daily production rate of 34,300 tons of uranium ore, which has a recovery ratio of 2 to 2.5 lb. of uranium oxide per ton of ore. During the next five years the 11 mines expect to produce over $1 billion of uranium oxide.

When all of the mines are in operation an estimated working force of 4,925 miners will be required, according to the Elliot Lake Chamber of Commerce. Each miner will mean an additional 4.5 persons including women, children, professional and business men, pushing the population to 27,000.

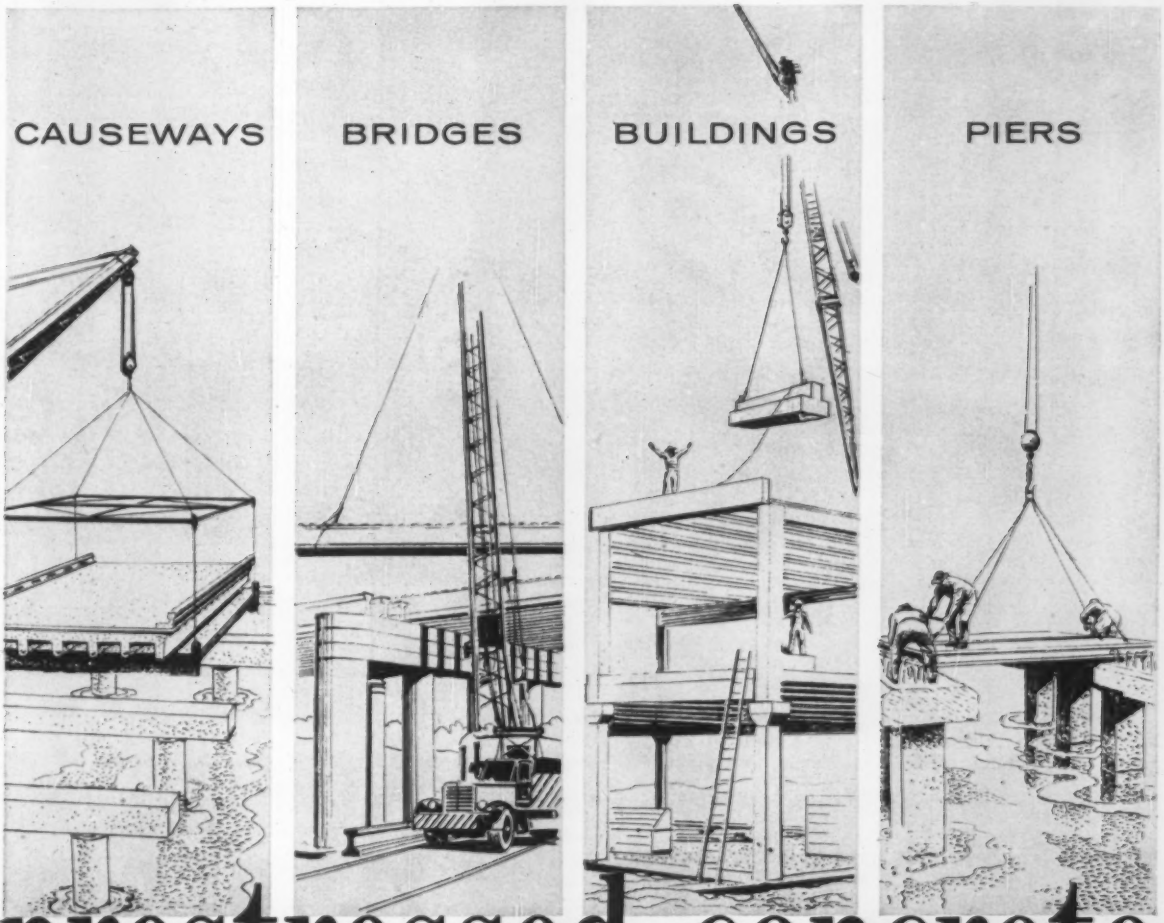
• **Joint undertaking**—Construction of Elliot Lake is a joint undertaking of the Canadian government, the mining companies and other private interests. The municipality is part of a 396 sq mi area called the Improvement District of Elliot Lake which is presently administered by a Board of Trustees supervised by the Ontario Department of Municipal Affairs.

The Improvement District is only temporary. As the project nears completion, a normal municipal form of government will be adopted, with local elections, council, and city officials.

The Ontario Department of Planning and Development serves as planning consultants in the development project. Marshall, Macklin & Monaghan, Consulting Engineers and Surveyors, of Toronto, were appointed engineers and surveyors on the project.

The need for a well-planned community in the vicinity of Elliot Lake became apparent in the summer of 1954, following the discovery of uranium ore in that area.

• **Virgin territory**—Acceptable townsites were few and far between in the "Blind River" uranium belt. Aerial searches for a suitable townsite were narrowed down by the fall of 1954 to a 5,000 acre area on the south shore of Elliot Lake. Even at its best, most of the area was virgin, wild bush country, with no access except by air—using light pon-



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Mid-South Concrete Pipe Co.
1977 Chelsea Avenue
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Ease of Installation counted heavily with the architect and builder who used Steeltex for concrete slabs on the Travis Junior High School in McAllen, Texas. Architect: Zeb Rike of McAllen. Contractor: W. E. Crawford Co. also of McAllen. Steeltex was chosen because of its "low cost, ample supply, ease of installation and low labor costs."

No wonder Steeltex is used everywhere when . . .

Steeltex saves 55 working days on one job

Elimination of forms was cited as a distinct Steeltex advantage by the architect for this job, the Riviera Hotel in Las Vegas, Nevada. When a 200-room addition was planned, Steeltex was specified for that, too. Architect: Roy F. France & Son, Miami Beach, Florida. Consulting Architect: J. Maher Weller, Las Vegas. Contractor: Taylor Construction Co., Miami, Florida.

On big jobs or small . . . in the East, West, North and South, you'll find Steeltex. Architects and contractors like the way it speeds work, cuts costs and makes better concrete slabs.

Steeltex, the Pittsburgh Steel wire mesh reinforcing that carries its own waterproofed form right on its back, is the answer to a big question that designers and builders face constantly:

"How can we maintain or improve quality on our tight budget and move in quicker?"

In California, Designer Robert Sherman, C.S.D., credits Steeltex with pulling him out of a jam when heavy rains and windstorms delayed construction of the $2,800,000 Villa Hotel in San Mateo.

For a while, Mr. Sherman said, it appeared that bad weather would hold up the opening past the start of the 1956 Republican National Convention in nearby San Francisco.

"When weather conditions finally let us go back to work, Steeltex saved us 55 working days or 20 percent of the total construction time," he related.

Speedy construction possible with Steeltex pulled the builders out of jam in construction of the luxurious Villa Hotel in San Mateo, California. This is the job where Steeltex saved 55 working days. Designer: Robert Sherman of San Mateo. Contractor: Pacific Development Co.

Low cost of changing plans when Steeltex is used made a hit with the builders of WSFA Radio and TV Center in Montgomery. Architects: John Shaffer and A. L. Williams Jr. Structural Engineer: Cecil Williams. Contractor: Bear Brothers Construction Co.

"We completed the hotel in time for the Texas delegation to occupy their reserved rooms."

Mr. Sherman, who has used Steeltex on everything from a closet-size used car lot headquarters to a big office building, said, "Builders who overlook using Steeltex on small jobs are missing a good bet."

Now, jump north to Erie, Pa., where E. E. Austin & Son, Inc., built a new Airport Terminal at the Erie Airport which was designed by Nelson, Goldberg & Heidt, registered engineers and architects. Construction Superintendent John McKinnon said:

"We've laid acres and acres of Steeltex. You can't beat it on costs. Why, Steeltex installed costs less than the lumber alone if we had to build forms."

A similar commendation came from Texas where the $380,000 Travis Junior High School is the pride of McAllen, Texas. For that job, Architect Zeb Rike chose Steeltex for 43,698 square feet of second floor and roof deck because of its "low cost, ample supply, ease of installation and low labor costs for installation."

On the same job, Contractor W. E. Crawford declared he had always gotten "fine results with Steeltex."

"All you do is unroll it, tighten it, clip it and pour concrete. I'd recommend Steeltex any place a fine masonry deck is needed."

In Las Vegas, Nevada, where there's no gambling in building construction, Steeltex was specified by Architect Roy F. France Sr. for 108,000 square feet on nine floors of the Riviera Hotel and a new 200-room addition. Mr. France said:

"Steeltex eliminated extra work because it did away with forms. It permitted quick installation and made for a less expensive job."

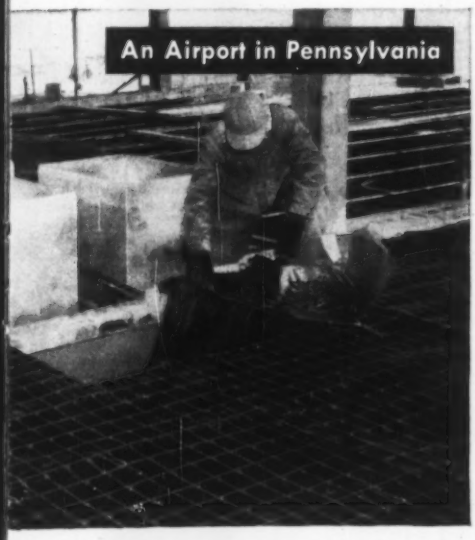
On a new office and studio building for Station WSFA in Montgomery, Alabama—the $145,470 WSFA Radio and TV Center—the building schedule was tight because of commitments made to the FCC.

Here Architects John P. Shaffer and Albert L. Williams Jr. found:

"Steeltex let us get the building closed in quicker and also allowed us to change our minds on the layout of the floor conduits required by a modern TV and radio station. We were grateful that Steeltex permitted us to make changes with a minimum of loss and delay."

Steeltex can provide savings in time and money for you, too, while giving you better, higher quality slabs.

Cash in now on the advantages of using Steeltex. You can do it by calling the nearest Pittsburgh District Sales Office listed below. Do it today.



The low cost of Steeltex compared to lumber for forms was cited during work on the new terminal at Port Erie, the airport at Erie, Pennsylvania. Architect: Nelson, Goldberg and Heidt of Erie. Contractor: E. E. Austin & Son, Inc., of Erie.

▶ See Sweets Catalog Section 2-B

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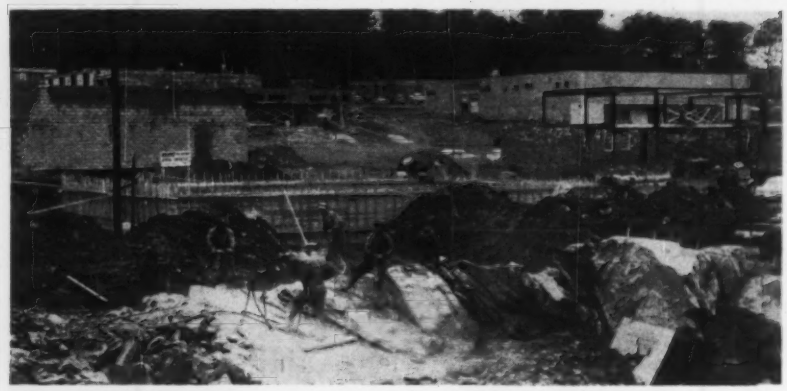


ROCK OUTCROPPINGS are expensive and hard-to-remove obstructions that are found throughout the Elliott Lake region.

ROUGH TERRAIN hampered homebuilding site-clearing, cost averaged $1,000 per acre.

toon-equipped planes which could land on isolated lakes.

Construction equipment and building materials—for the uranium mines and concentrator mills, as well as for the construction of Elliot Lake—had to be trucked in over a most difficult haul road connecting with Highway 17. Under the best of conditions it required 5 or 6 hours for tractor trains and trucks to make the 20 mile trip during the 1955-56 construction seasons. Since then, the old road has been improved and surfaced with a 24 ft bituminous pavement, by the Province of Ontario.

• **Neighborhood communities**—Because of the hilly terrain involved, the "neighborhood" pattern of community development was considered an absolute must. Instead of the neighborhood units being separated by major arterial roads, however, they are separated by hundreds of feet of bedrock outcroppings, precipitous slopes and low lying land.

There are eight neighborhoods in the master plan of Elliot Lake townsite. They are separated from each other by perimeter roads, hilly terrain or undeveloped areas. Municipal services have been installed for the first three neighborhoods which contain a total of 1,570 residential lots. Most of these lots have been sold either to the mining companies or to private individuals. With but few exceptions, each lot is occupied by a completed house or one that is under construction.

The 5,000 acres comprising Elliot Lake townsite includes not only the areas required for homebuilding and other urban development but also the open, non-buildable areas separating the eastern and western sectors of the townsite.

About 900 acres of the townsite will be devoted to residential construction. The non-buildable areas have a combination of several factors making them unsuitable for development. They include: high water table; muskeg, quicksand and other unstable soil; shallow overburden or rock outcropping; and steep slopes.

• **Homebuilding**—In general, the mining companies are the homebuilders for those houses to be occupied by their employees. The companies buy the building lots from the Corporation of the Improvement District of Elliot Lake—which provides water, sewerage, electricity and other municipal services—and contract for the erection of the houses.

The mines also arrange for financing the homes over a 20 to 25 year period with bank mortgage loans. These loans generally are guaranteed by the government's Central Mortgage and Housing Corporation (CMHC) with the mining companies acting as co-guarantors.

• **Sold at cost**—The houses are sold to the miners at cost. They range in price from $9,500 to $13,000, with downpayments ranging from $800 to $1,150, and monthly payments of $70 to $80.

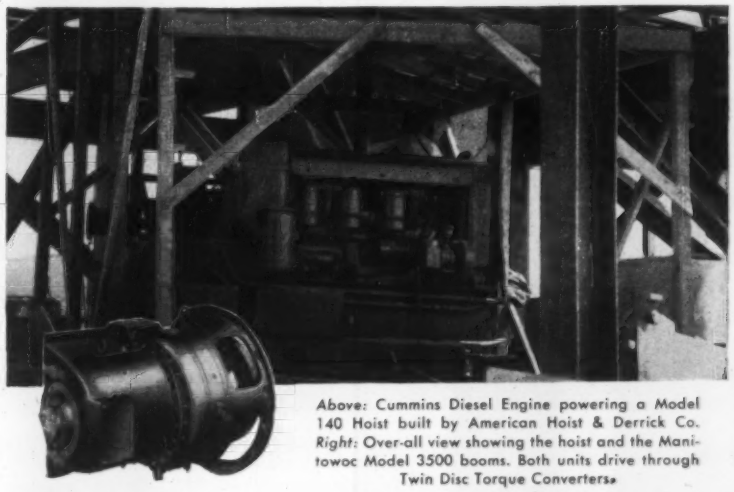
The timber frame, insulated houses have two, three and four bedrooms. There are about eight basic types, including bungalows, 1½ story and 2 story houses. They are painted a variety of striking pastel colors. Generally they are fabricated at the site, from plans furnished by the building contractors and approved by the mines and CMHC. Some of the houses are prefabricated.

An estimated 3,000 houses will be needed for mine employees. Of this number about 1,300 have been completed or are nearly finished; about 1,000 will be completed this year; and 700 during 1959. An additional 2,000 homes will be needed for other than mine employees, by the end of next year.

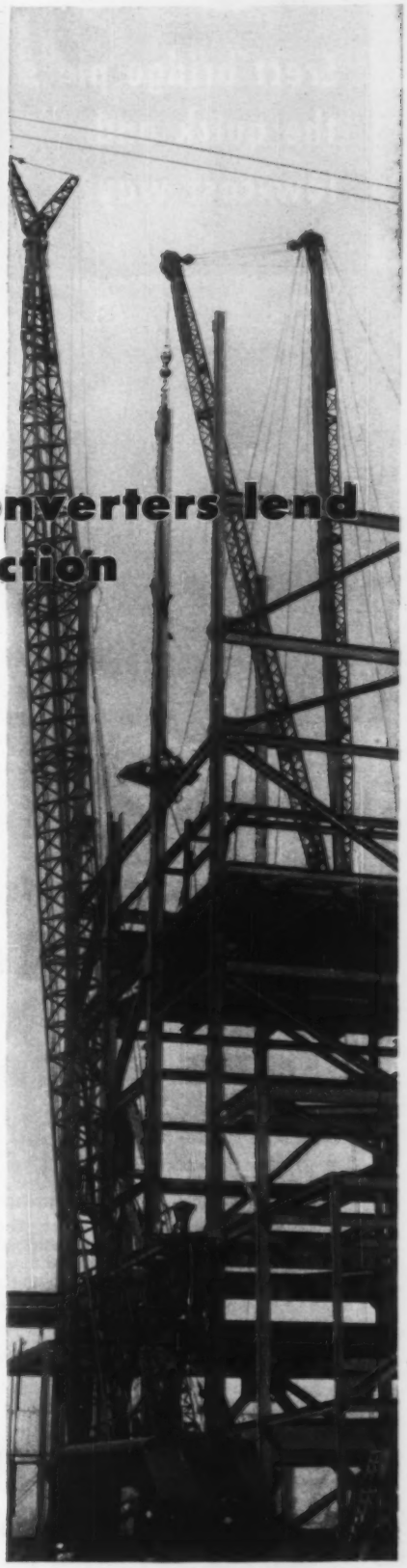
The mining companies have no trouble selling the houses. In fact, there is a long waiting list and even before a house is finished its purchaser has already signed up for it and made a downpayment. The mining companies have various priority systems for selling the houses on an equitable plan to their employees. Seniority is one of the main factors, together with job rating and extreme need.

The master plan for the townsite contemplates some rental property for single persons and those not wishing to buy houses. But in general the mining companies are anxious to sell the houses. This not only gives the purchaser a stake in the future of the community but gets away from the idea of a company-owned town.

• **Municipal expenditures**—About $23 million worth of municipal facilities are being furnished. Major items include about $10 million for water supply and sewage treatment systems; $3.5 million of municipal streets; $3.2 million of schools; $2.0 million hospital for which the mining companies sub-



Above: Cummins Diesel Engine powering a Model 140 Hoist built by American Hoist & Derrick Co. *Right:* Over-all view showing the hoist and the Manitowoc Model 3500 booms. Both units drive through Twin Disc Torque Converters.



How heavy-duty torque converters lend "gentle touch" to steel erection

At ALCOA's Warrick Works, now under construction near Evansville, Indiana, bystanders are daily witnessing two steel erecting machines performing with all the grace of an accomplished ballet dancer . . . and doing it with loads up to 29 tons!

The machines are part of the equipment operated by John F. Beasley Construction Co., Chicago. One is a Model 140 Hoist manufactured by American Hoist & Derrick and equipped with a Cummins Diesel Engine and a Twin Disc Three-Stage Torque Converter. The other is a Manitowoc Model 3500 erecting crane with a Caterpillar D17000 Diesel Engine and a Twin Disc Three-Stage Torque Converter.

The two erecting machines are working on 16-story structures for a power plant. The work requires very delicate steel setting . . . such as setting 17-ton cross members between columns and then, with a steel ball weight, gently tapping them into place.

As E. J. Delahousay, of John F. Beasley Construction Co., puts it: "With Twin Disc Torque Converters, you can swing fast . . . and lift without fear of engine stall. They make the machines handle easier and enable the operator to place his load just where it has to go!"

Twin Disc Torque Converters are excellent for delicate holding and inching of loads through simple throttle manipulation. Besides this, however, they prove their worth in many ways . . . such as permitting engines to operate in their most efficient speed range at all times, with full hp output available whenever required . . . automatically matching engine torque to load requirements . . . cushioning out destructive shocks and vibrations between driving and driven equipment . . . and holding constant tension on cables, for greatly increased cable life.

Be sure to specify a Twin Disc Torque Converter with your next new excavator, crane or hoist. They are available in both three-stage and single-stage designs . . . from 30 to 1000 hp in capacity.

Twin Disc Clutch Company, Racine, Wisconsin; Hydraulic Division, Rockford, Illinois.

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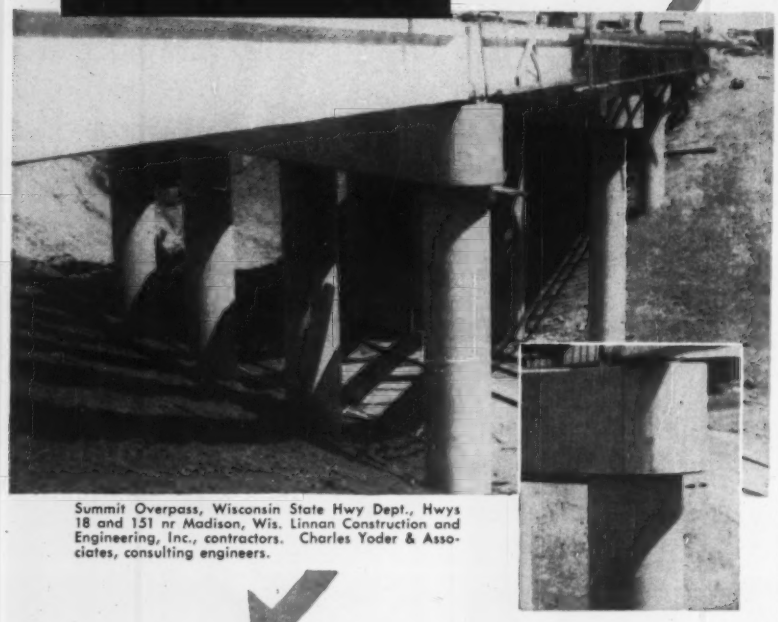
Erect bridge piers the quick and low-cost way!



Summit Overpass, Wisconsin State Hwy Dept., Hwys 18 and 151 nr Madison, Wis. Linnan Construction and Engineering, Inc., contractors. Charles Yoder & Associates, consulting engineers.

Form round concrete columns with

SONOCO
***Sonotube*®**
FIBRE FORMS

ARBA EXHIBITION
Booth 82-83
Sheraton Park Hotel
Washington, D. C.
Jan. 20-23, 1958

In this project, 26" I.D. Sonoco Fibre Forms were used to erect the supporting columns.

But whether the structure is a bridge or a building, contractors everywhere have found that Sonoco Sonotube Fibre Forms provide the fastest, most economical method of forming round columns of concrete!

Sonoco forms take less time to erect, require minimum bracing, and are easy to strip. Because of their versatility, low cost and easy handling these fibre forms save you time, labor and money!

Order Sonoco Sonotube Fibre Forms for your next job . . . sizes from 2" to 48" I.D., up to 48' long. Sonoco's patented "A" coated forms are for finished columns. Wax-coated also available.

See our catalog in Sweet's

For complete information and prices, write

- HARTSVILLE, S. C.
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SONOCO
Construction Products
SONOCO PRODUCTS COMPANY

2835

. . . Homebuilding in new city

PERIMETER ROADS designed for heavy traffic required heavy rock excavation and expensive right-of-way clearing.

scribed over half the cost; $600,000 worth of street lighting; and over $1 million of such municipal facilities as police, fire department, municipal building, library, and municipal employee housing.

Of the $23 million of municipal facilities, the Ontario government through its Municipal Improvement Corp. will underwrite about $15 million, financed by 10 year to 20 year debentures. The remainder will be secured by the Improvement District through private lending institutions.

• **Commercial areas**—One large central commercial area and two industrial areas will serve the eight neighborhood areas. In addition, each neighborhood will have one or more small commercial areas. The 200 lots in the commercial area are all sold and a number of commercial establishments are being built on them. The lots were sold at auction by the municipality for prices ranging from $500 to $40,000. The average sale price of a 17x100 ft commercial lot module was in the neighborhood of $1,500. The central commercial area covers about 33 acres.

The two industrial areas—for wholesale distribution, bulk storage and general warehousing—cover about 50 acres. Neighborhood commercial areas range in size up to 5 acres each.

Present plans call for the construction of about 30 permanent business establishments to serve Elliot Lake's growing population. About one-half are already completed and the others under construction. They include the present 40 room Algonden Hotel; a department store and supermarket by the famed Hudson's Bay Company; recreational facilities, banks, newspaper, and complete service establishments comprising modern shopping centers.

Off-street parking facilities will be provided in the local neighborhood

paces road utility work

MUNICIPAL SERVICE installation is hard pressed to keep up with homebuilding in some neighborhoods.

shopping centers on the minimum basis of 1 sq ft of parking space for each square foot devoted to commercial sales.

Several church sites are provided in each neighborhood. Each site is designed for adequate off-street parking.

The residential areas are separated from commercial and industrial areas by park areas.

Major collector roads encircle the residential neighborhoods, connecting with interior roads and streets. Substantial stretches of the streets and roads are curved to fit the hilly terrain.

In addition to the circumferential roads there will be about 18 miles of gravel surfaced streets in residential areas and bituminous paved streets in commercial and industrial areas. Nearly one-half of these roads and streets are finished.

Street grades are limited to a maximum of 10% and a minimum of 0.5%. Pavement widths vary from 20 to 34 ft.

In developing the plans for Elliot Lake the foremost intentions of the Community Planning Branch of the Department of Planning and Development were to design a community which would be pleasant, safe and convenient. And to provide an environment which would satisfy the physical, aesthetic and intellectual needs of all its inhabitants.

That these objectives will be obtained appears to be a certainty in view of the painstaking design and orderly construction being built into the development.

• **In charge**—A. L. S. Nash is director of the Community Planning Branch of the Department of Planning and Development. Percy L. Brown is secretary-treasurer of the Elliot Lake Improvement District, and J. T. Gauthier is president of the Elliot Lake Chamber of Commerce. Plewes Tooker is municipal engineer.

Minimum bracing for formwork saves time and money!

Bypass bridge, US Rte. 40, St. Clairesville, O. Replogel Const. Co., contractors. State of Ohio bridge.

End of caps formed with half-sections of fibre forms.

Form round concrete columns with

SONOCO
Sonotube®
FIBRE FORMS

ARBA EXHIBITION
Booth 82-83
Sheraton Park Hotel
Washington, D. C.
Jan. 20-23, 1958

See how little bracing is required when you use Sonoco Fibre Forms!

On this job, 36" I.D. fibre forms in lengths from 19' to 36' were erected quickly and easily . . . and after the concrete had set, the forms were stripped by a simple method.

To form the ends of the caps, Sonoco Sonotube Fibre Forms, sawed in half on the job, were used.

You can save time, labor and money on any job . . . buildings or bridges . . . because low-cost Sonoco Sonotube Fibre Forms provide the fastest and most economical method of forming round concrete columns.

Order in sizes from 2" to 48" I.D. up to 48' long. For finished columns specify Sonoco's patented "A" coated forms; wax-coated also available.

See our catalog in Sweets

For complete information and prices, write

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2836

SONOCO
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Indiana Turnpike
sets the pace

The Indiana Toll Road scored a "first" with steel pipe snow melting systems at all of its Toll Plaza areas. This innovation in highway construction will, in the opinion of informed engineers, add immeasurably to the safety factors in bad weather and increase the traffic handling capacities at these vital points of entrance and egress.

In the national highway program, full consideration should be given to the advantages of steel pipe snow melting and ice removal systems for interchanges, bridge floors, elevated ramp sections, over-passes and other road sections where conventional control methods are no longer adequate.

Only Steel Pipe gives *all* these advantages:

- **Low cost with durability**
- **Strength unexcelled for safety**
- **Formable—bends readily**
- **Weldable—easily, strongly**
- **Threads smoothly, cleanly**
- **Sound joints, welded or coupled**
- **Grades, finishes for all purposes**
- **Available everywhere from stock**

Steel Pipe is First Choice

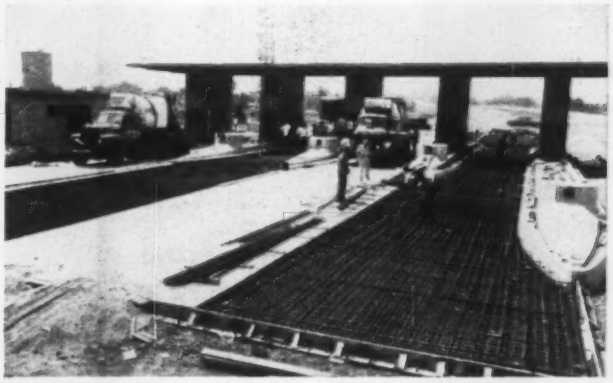
Committee on

STEEL PIPE RESEARCH

AMERICAN IRON AND STEEL INSTITUTE

150 East Forty-Second Street, New York 17, N.Y.

need automatic snow and ice removal on your next big job?



Steel Pipe snow melting grids in process of installation on toll plaza and plaza approaches of Indiana Turnpike.

Indiana Turnpike Toll Plaza after a heavy snow shows effectiveness of automatic Steel Pipe snow melting.

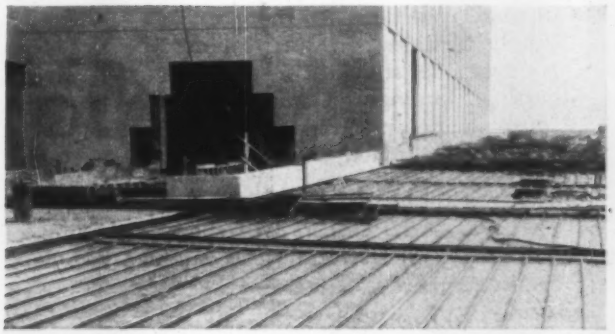
Whether for a great new highway, bridge, skyscraper or airport, a steel pipe snow and ice removal system may be indicated . . . if the project is to meet not only the demands of today but, more importantly, those of tomorrow.

More and more consulting and construction engineers realize that an initial expenditure for steel pipe snow and ice removal installations may be repaid in a relatively short time by elimination of costly manual or mechanical removal methods, decreased maintenance and labor costs, and greater safety, mobility and convenience.

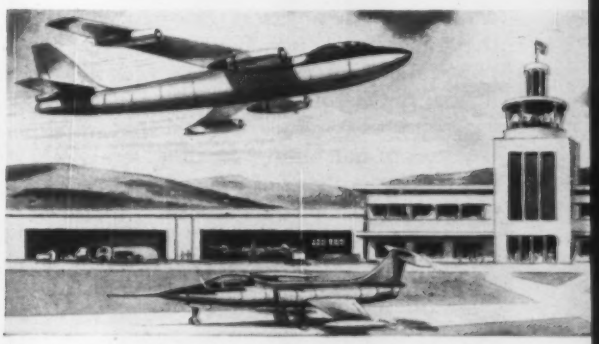
Steel pipe . . . the most widely used pipe in the world for snow melting, radiant heating, fire sprinkler systems, electrical raceways, steam, air and fuel piping . . . is just right for the heat transmission lines and grids of such modern snow melting systems.

Send for this FREE booklet

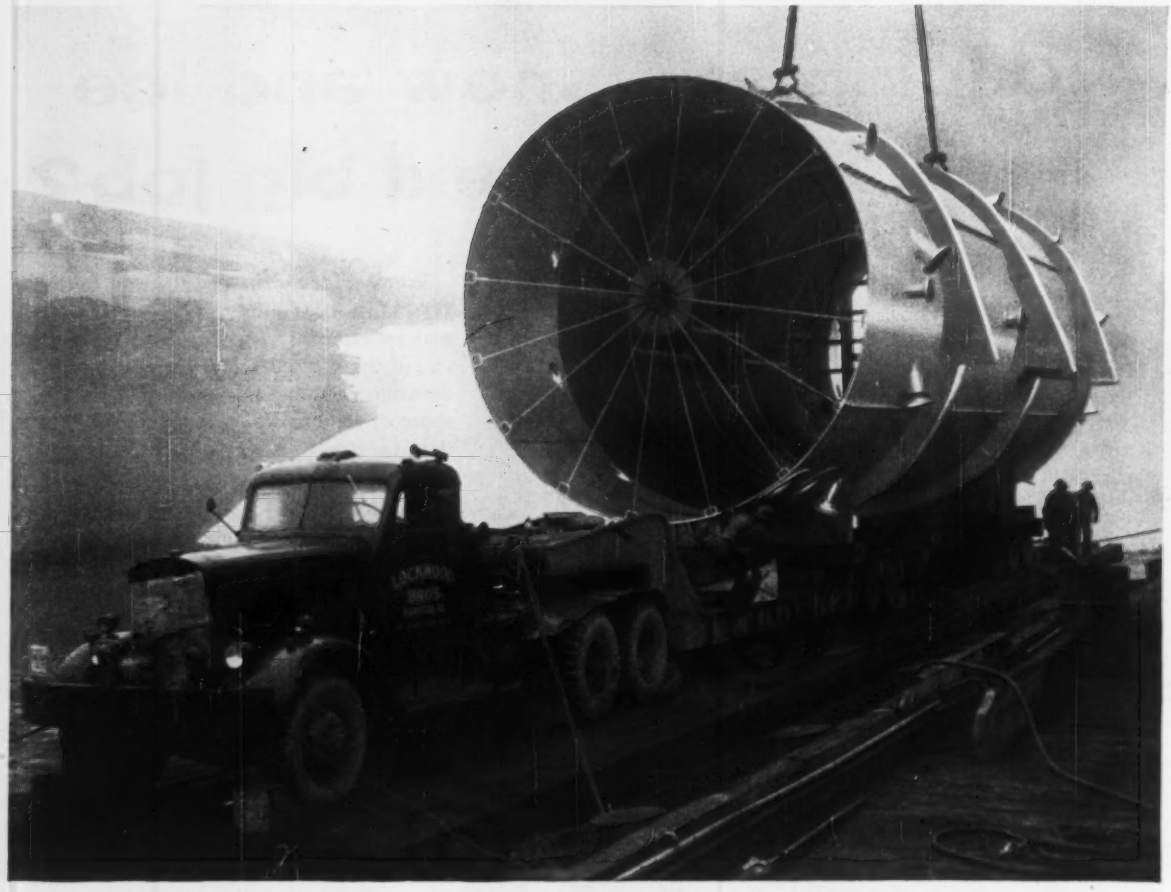
A free 48-page booklet, "Steel Pipe Snow Melting and Ice Removal Systems" containing valuable engineering data, is yours for the asking. Write for it today.



Steel Pipe sidewalk snow melting systems, like this one at Chicago's Prudential Building, are an economic "must."



With the jet aircraft age upon us, Steel Pipe snow melting for airport runways and aprons will solve many problems.



Unusual Handling Technique – Road clearances to Langley Field were not suitable for transporting the 53-foot long, 123-ton heat accumulator so Newport News made special loading and installation arrangements. The huge shell was first loaded on a "barged" trailer-truck and shipped to a location near the site. From that point it was pulled off by use of a ramp and hauled directly to the site where it was jacked into position.

Tap the resources of Newport News to fill an order like this one

This 123-ton, stainless clad Carilloy T-1 steel heat accumulator, (probably the first vessel made of this type steel), was built for the Langley Aeronautical Laboratory of the National Advisory Committee for Aeronautics. This *special purpose* unit incorporates 70 years of metal working experience. Decades of machining, welding, stress relieving ... fabricating millions of tons of steel into thousands of diverse products.

This experience goes into every unit built by Newport News ...

Into products that range from small components of textile machines, to the giant 165,000 hp hydraulic turbines at Grand Coulee. Newport News is a source for standard or special plate fabrication, castings, forgings, weldments and sub-assemblies. Particularly, large units ... single or multiple. Your inquiries are invited.

A brand new, easy-to-read, illustrated booklet, *Facilities and Products* will show you scores of ways in which Newport News can help you. Send for it today.

Newport News Shipbuilding and Dry Dock Company
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Engineers – Desirable positions available at Newport News for Designers and Engineers in many categories. Address inquiries to Employment Manager.

RAISED FIRST FLOOR of apartment house was staging for . .

. . . **SLIP FORM OPERATION** at a British housing project.

Ten Stories Concreted in Nineteen Days

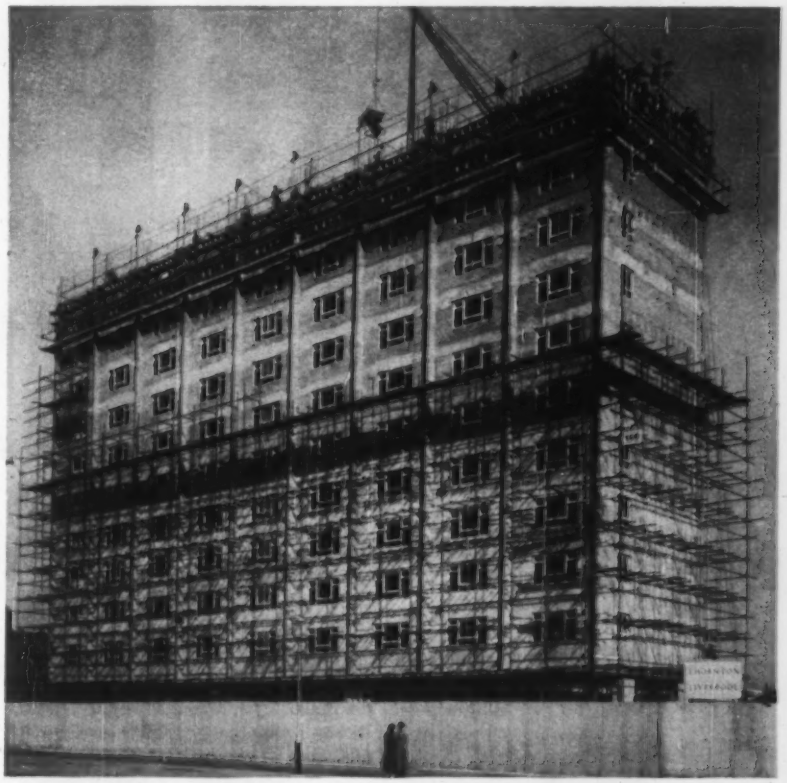
Slip forms have enabled a British contractor to erect the shell of a 10 story reinforced concrete apartment house in 19 days. The 40 family building is part of a $1.8 million public housing project in Birkenhead, Cheshire, across the Mersey River from Liverpool.

After construction of the elevated first-floor slab, William Thornton & Sons, Ltd., Liverpool contractor on the job and British licensee of a Swedish slip-form system called "Prometo," erected 10 stories of walls, floors, doors and windows at the rate of one story every two days. Six weeks later the building was ready for occupancy.

The slip-form operation involved 650 lin ft of sliding form—for exterior walls and pilasters, interior cross walls, an elevator shaft, and the inside and outside faces of two rubbish chutes.

The forms advanced upward along vertical steel bars at the rate of a little more than 1 ft per hr. Lifting was accomplished by 138 jacks, connected in parallel in two hydraulic systems, each system with its own control panel and 3½ hp electric motor.

The first day of each two-day cycle was spent concreting. The mix was placed in 2 in. lifts and spaded by hand. The forms were raised in similar increments. During the full shift the walls rose one story—9 ft. As work progressed,



LAST DAY of the slip-form operation finds the forms at the top of the 10 story building and pipe scaffolding for wall-finishing work in place up to the sixth floor.

window openings and other apertures were blanked out in the forms by boards or by the windows themselves. Niches for floor beams also were boxed off, and provision was made for utility conduits and pipes.

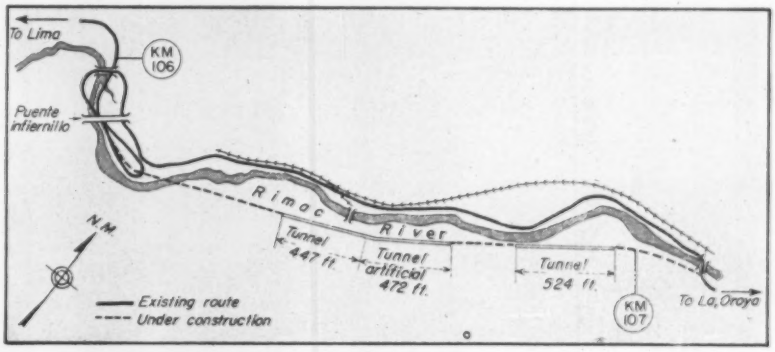
The second day, prefabricated floor sections were erected, and windows and other items needed for the next day were placed near the point of use. Floors were of two types:

(1) Wood between the two stories within individual apartments—which were duplex.

(2) Prestressed concrete between apartments.

The concrete was mixed on the site in a 2 cu yd mixer and pumped by a 6 in. pump to a surge tank alongside the building. From there it was raised in bottom-dump buckets by two rail-mounted cranes.

Designers of the building were T. A. Brittain, Birkenhead Borough architect, and his associate, Donald Bradshaw. Consulting engineers were Ove Arup & Partners.

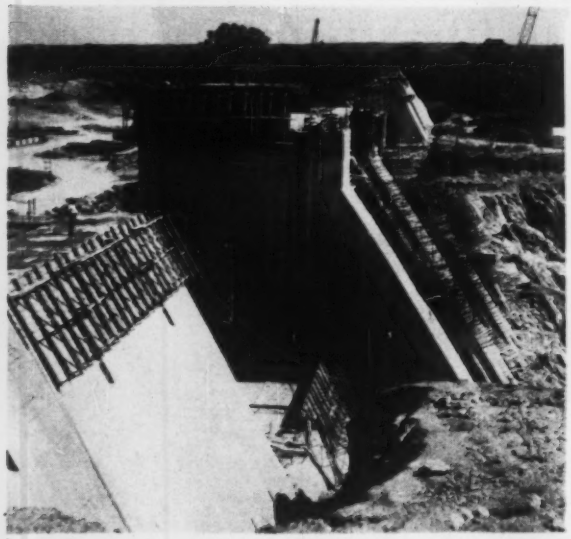


Havana Auto Tunnel Nearing Completion

After more than three years of construction work—and 50 years of planning—residents of Cuba's capital of Havana now expect to see a new vehicular tunnel completed early in 1958.

The $28.5 million tunnel, largest and most expensive engineering feat undertaken in the city, will be a four-lane tube, 1,800 ft in length, connecting Havana with East Havana. A French firm, Societe des Grandes Travaux de Marseilles, is the contractor and also will provide some financing.

The tunnel itself consists of five sections of prestressed concrete tube, sunk in place. Each is 360 ft long, 73 ft wide, and 24 ft high. The trench allows a 46 ft channel in the bay.



Hamilton Wright photos

Concrete gravity dam will have no storage as it diverts the Caroni River to Francis-type turbines at . . .

Caroni Dam—Power for a Steel Mill

Caroni Dam on the Caroni River in Venezuela will be ready to put the first part of its 300,000 kw ultimate capacity on the line sometime in spring of next year. And the $36 million project's power will practically all go to a steel mill now under construction at a first stage cost of $360 million—final cost, $420 million. The mill will process ore from Cerro Bolivar.

The concrete gravity dam will rise a maximum of 246 ft and set up an average head of 132 ft. There will be no water storage; generating units are keyed to operate on river's minimum flow.

Steel penstocks, 24.5 ft in diameter, will carry water to a powerhouse of reinforced concrete. This eventually will house six Francis-type turbines coupled to six 50,000 kw generators. However, only 50,000 kw are scheduled for 1958, and 200,000 kw for 1959.

The Caroni project is considered only a small piece of the hydroelectric potential of the Caroni River, which is a tributary of the Orinico. A survey made of the 2,500 sq mi Caroni Basin points to a potential of 8 million kw for a 130 mile stretch of the river south from its junction with the Orinico.

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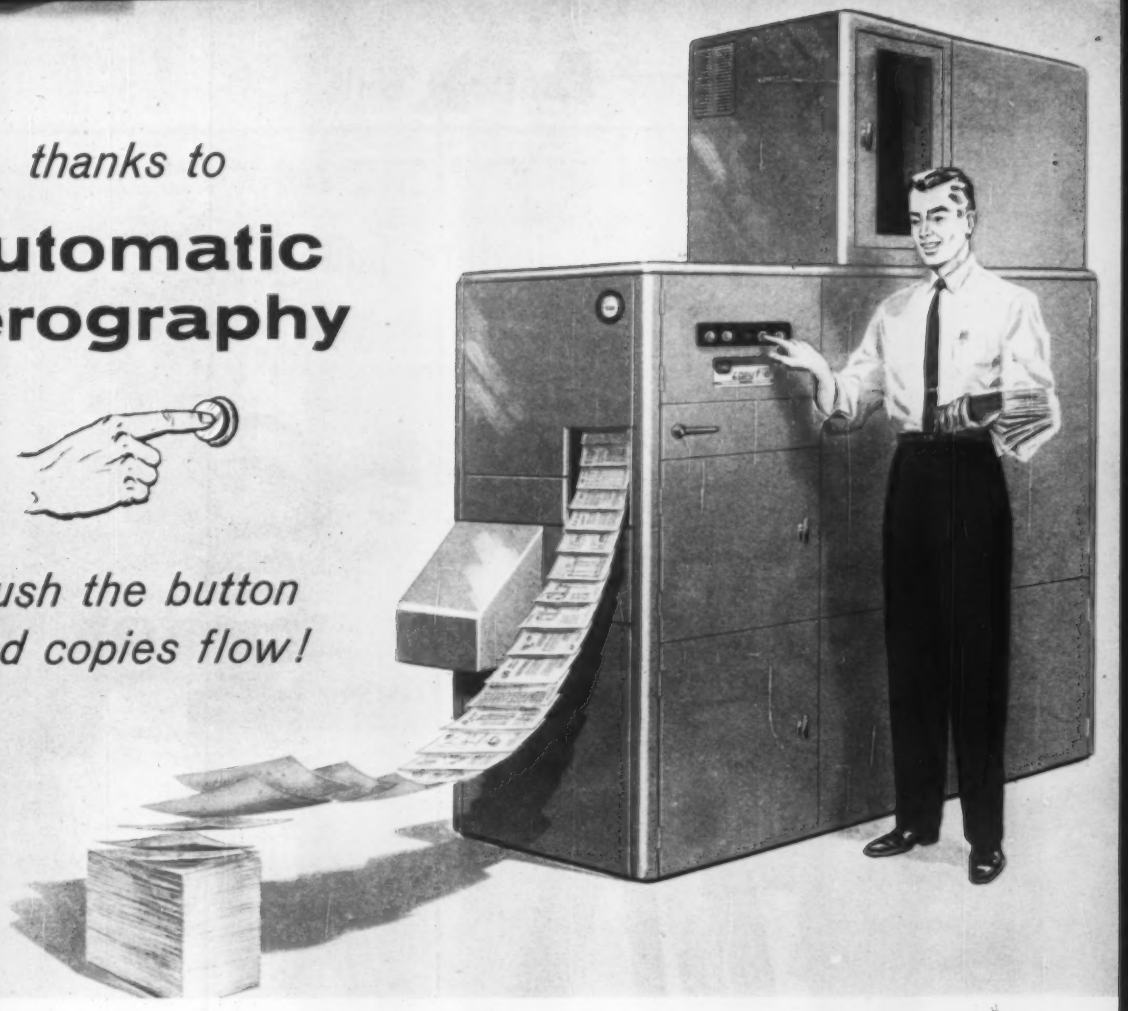

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The Copyflo Continuous Printer turns out beautifully clear, right-reading prints of engineering drawings, letters, charts and other documents—4 to 11 inches wide and each precisely like the original—on plain unsensitized paper, transparent vellum or offset paper masters, at the rate of 20 feet a minute. This is the equivalent of a full 8½" x 11" copy every two seconds.

The Copyflo Continuous Printer represents a revolutionary advancement in the universally accepted, dry, electrostatic, photo-exact process of xerography.

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Copy 1200 **different** documents per hour—a print in about 2 seconds.

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Low cost—proven savings to 70%. . . . as much as $100,000 a year.

Two Gurley transits feature built-in optical plummets

Gurley OP-57

Gurley OP-137

The Gurley Optical Plummet Transit (Model OP-57) has proved itself to be such an important time and money saver in the field that this optical plummet feature has also been added to the Model 132 Standard Precise Transit. The new transit will be known as the OP-137.

Both these Optical Plummet Transits will save you time and trouble in setting over a point. The OP-57 and OP-137 eliminate the swing and sway of the cord and plummet—exasperating and time consuming. You will especially appreciate the increased accuracy on windy locations.

By rotating the instrument 180°, you can be assured of positive centering.

The Gurley Optical Plummet Transits are furnished with tripods which have built-in shifting heads. They allow a two-inch shift of instrument over the point, providing greater latitude in initial set-up.

Model OP-57 is recommended for very exacting work; the OP-137 for general engineering and construction work because of its shorter telescope, smaller size and its lighter weight.

Now in *two* models Gurley offers you an important advantage of the optical-reading theodolite *plus* the simplicity, ruggedness and proved performance of the American transit. *Write for new Bulletin OP-100.*

GURLEY

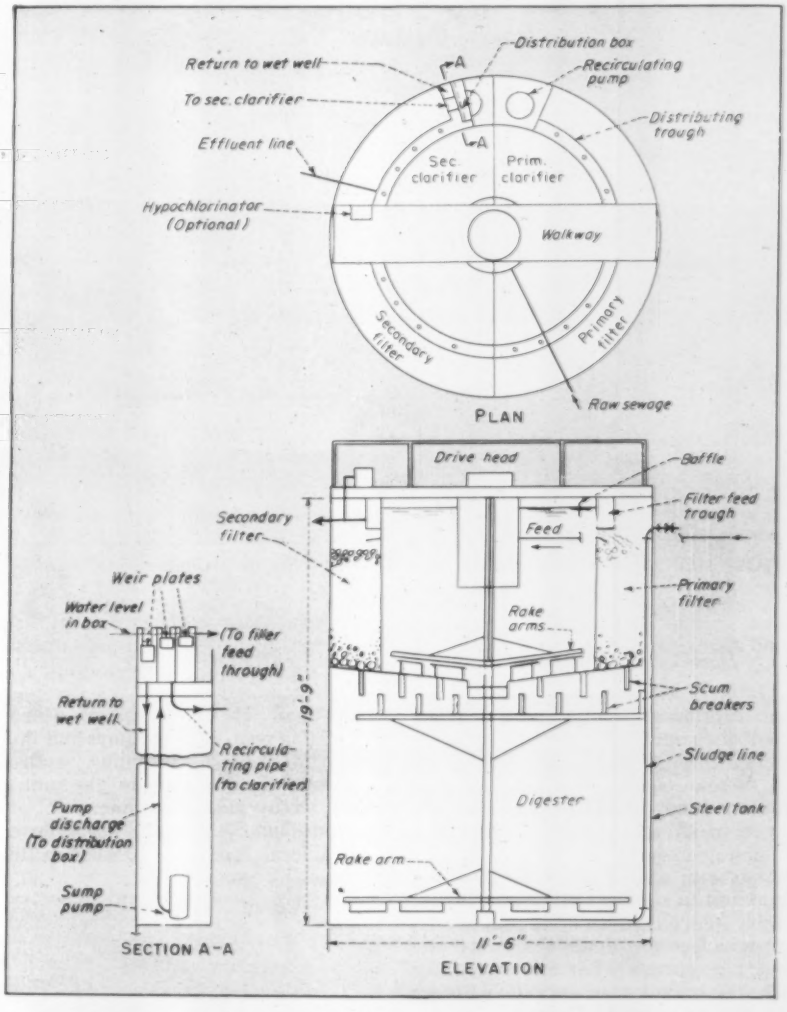
W. & L. E. Gurley

Engineering Instruments Division

Troy, New York

Since 1845

TRICKLING FILTER plant is shipped complete in 11½ ft dia 20 ft high steel tank.



SCHEMATIC of Dorr-Oliver's new CompleTreator which comprises two stage filtration, two settling chambers and digester.

Complete Sewage Treatment Plant for 150 Persons

Dorr-Oliver has unveiled a complete sewage treatment plant that will handle wastes of up to 150 persons or their equivalent in biochemical oxygen demand (BOD) loading. The two-stage trickling filter plant, named the CompleTreator, is shipped complete in an 11½ ft dia steel tank 20 ft high weighing 25,000 lb. An installer need only provide a foundation pad, place filter underdrains and stone in the unit and connect influent, effluent and sludge lines and electrical service.

Operating results from a number of early installations show BOD and suspended solids removals comparable to large scale two-stage filtration plants—upwards of 90% for both. The CompleTreator is seen applicable for wastes, housing developments, restaurants, service stations, military installations, schools and for domestic-type wastes from industrial activities.

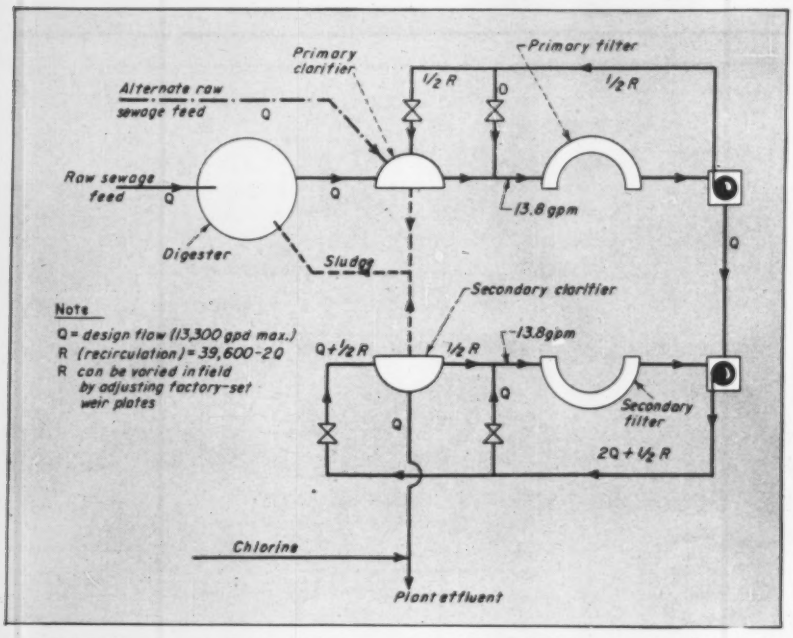
• **Septic tank competitor?**—Although its current price—usually less than $25,000 installed—will not quite compete with the usual individual septic tank or cesspool installations (when they are allowed) in housing developments, only a modest decrease in cost would permit it to compete in areas of average soil conditions.

The new package plant requires minimal operating attendance, chiefly to draw off sludge periodically from the digester compartment. If effluent were chlorinated the hypochlorinator crock would also have to be checked and filled periodically.

The unit does not incorporate a chlorinator, although one can be added. Because of the plant's relatively great depth, influent would be pumped to it in a majority of installations.

The CompleTreator comprises a Dorr Duo-Clarigestor surrounded by two stages of high rate trickling filters and two recirculation pumps submerged in respective wells. In principle, then, the CompleTreator is not new, but it does incorporate in a single unit what normally requires five separate tanks in large scale installations.

• **Plant flowsheet**—Raw sewage can be introduced directly into the influent well of the primary clarifier or to the digester, for grease removal, whence it flows into the primary clarifier. This



FLOWSHEET of new plant which can remove 90% of BOD and suspended solids.

first clarifier provides 2 hr detention and a 900 gal/day/sq ft of surface overflow rate. Maximum raw sewage flow (Q) is 13,300 gal/day. Settled solids are continuously raked to the center and discharged into the 909 cu ft digester through a one-way seal similar to those installed on standard size clarigesters (sludge blocking entrance prevents backflow of digester supernatant).

Sewage leaving the primary clarifier passes over a weir along the periphery and into an annular feed trough. It then flows through spaced holes into splatter plates which distributes the sewage over the filter surface. The first stage filter, like the second stage, consists of 165 cu ft of 2 in. stone 6¾ ft deep.

Filtrate is collected in underdrains and flows into the primary wet well. An oversized non-clog sump pump with bladeless impeller sends the sewage up into a clever weir box equipped with three adjustable weir plates (factory-set in accordance with the flowsheet). One of the weirs discharges into the primary clarifier, the second allows discharge into the first stage filter feed trough (usually zero flow), and the third weir returns sewage to the primary wet well.

As liquid level in the primary wet well builds up, sewage overflows into the secondary wet well where a second sump pump discharges to a second weir box. Here, one weir discharges into the secondary clarifier, the second feeds the secondary filter and third weir returns to the wet well. Changing liquid level in this well operates a float-controlled butterfly valve in the plant effluent line which taps the overflow trough of the secondary clarifier. Head loss through the plant is 2 ft.

In event of power failure which would stop recirculation pumps and the sludge mechanism, incoming sewage (assuming gravity flow to the unit) would receive primary settling.

More than 30 CompleTreators have been sold at this time, 20 of these to the U.S. Army for installation at Nike sites throughout New York State. Other units have been operating at resorts and industrial facilities since July 1957. The package plant is protected by patents, both issued and pending. It is understood the company is studying the possibility of substituting air lifts for the two sump pumps. DORR-OLIVER INC., BARRY PLACE, STAMFORD, CONN.

CRANE maneuvers a 25,000 lb package. Installer provides foundation, filter media.

Shoring System Cuts Erection Time by 40%

A new system of shoring now is available that, the manufacturer claims, can be erected in 40% less time than standard shoring, at sharply reduced cost. The system is flexible; towers can be built in 1 ft steps for all heavy-duty concrete shoring purposes on municipal projects, including bridge foundations, buildings, reservoirs, highways.

Requiring no nuts, bolts or X-bracing, the shoring has only three basic components—tubular steel frame, ledgers and screw jack.

The system is being offered to distributors under an exclusive franchise plan. BRAINARD STEEL DIV., SHARON STEEL CORP., SHARON, PA.

Accurate Diaphragm Pump Meters Corrosive Liquids

A new, controlled-volume, diaphragm pump meters toxic, noxious or corrosive chemicals and liquids within ±1%, the manufacturer claims.

The pump is equipped with a Teflon diaphragm sealing the liquid ends from the plunger and housing. There is no mechanical connection between the diaphragm and the plunger. The plunger displaces hydraulic fluid, which in turn, strokes the diaphragm to impart pumping action through double ball checks.

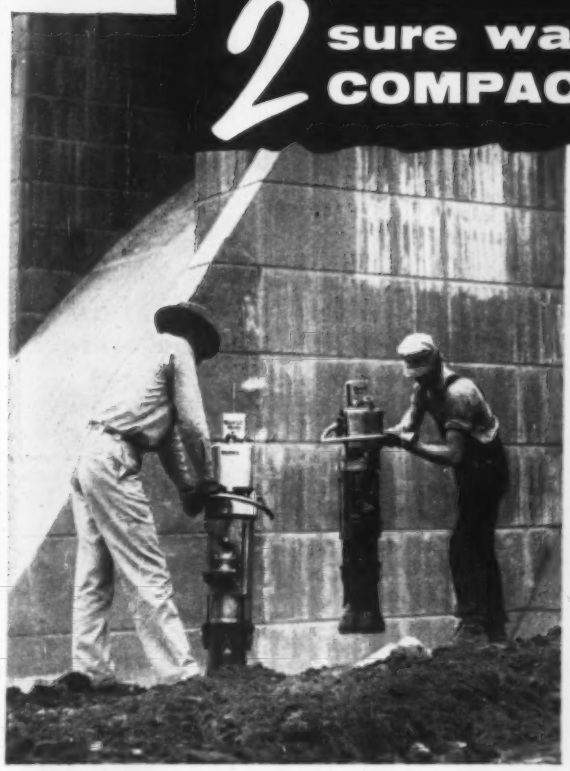
The pumps are available with maximum capacities from 1.1 to 138 gal per hour and pressures to 2,000 psi. MILTON ROY CO., 1300 E. MERMAID LA., PHILADELPHIA 18, PA.

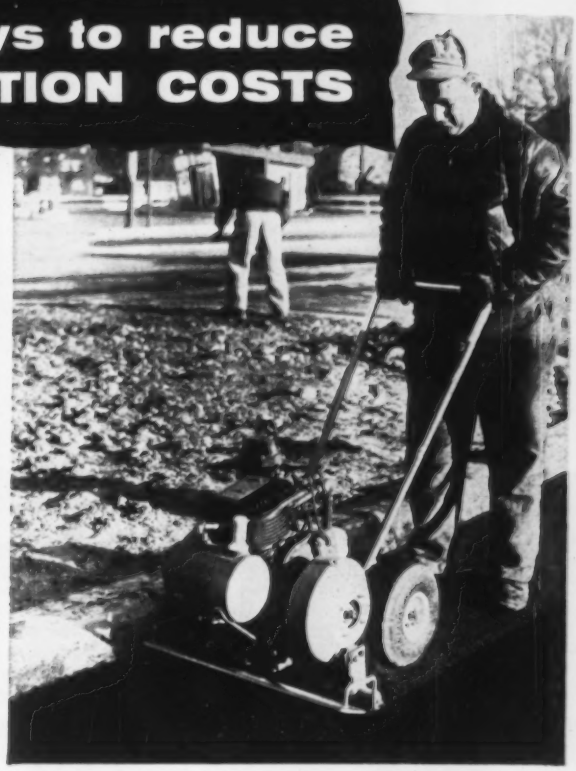
Prefab Asphalt Liner Cuts Channel Seepage

A prefabricated asphalt liner now is available to prevent seepage of water, brines, sludges and sewerage through the walls of reservoirs or channels.

The liner is an asphalt mastic sheet in ½ and ¼ in. thicknesses and 4 ft widths. Marketed under the name of "Aqualiner", the sheets are flexible to withstand repeated contraction and expansion, ground movement and frost action. PRESSTITE-KEYSTONE ENGINEERING PRODUCTS CO., 39TH ST. AND CHOUTEAU ST., ST. LOUIS, MO.

2 sure ways to reduce COMPACTION COSTS





THE BARCO RAMMER

Put Barco Rammers on the job and watch the results. One of the biggest advantages they offer is ability to handle work in minimum time.

HIGH DEGREE COMPACTION — In test after test, Barco Rammers have demonstrated their ability to deliver 95% to 97.5% compaction (modified Proctor Method) — EASILY! EFFICIENTLY! ECONOMICALLY!

FOR TOUGH JOBS — The Barco Rammer is especially useful for compacting fill in restricted areas close to walls, culverts, and abutments — in trenches, ditches. ONLY the Barco Rammer can produce specified high degree compaction on lifts up to 20 inches.

ONE MAN OPERATION — On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour.

Ask for Catalog 621

THE BARCO VIBRA-TAMP

The new Barco VIBRA-TAMP is a proven tool — superior in design and performance — backed by leading equipment distributors representing Barco in all parts of the country.

VERSATILE PERFORMANCE — For vibratory compaction of granular base materials and tamping bituminous surfacing.

ECONOMICAL — to buy, operate, and maintain! No special tools required. Saves your bigger, costlier equipment. Tamp up to 750 sq. yds. per hour. A real work-horse on sand, gravel, soil, chippings!

EFFICIENT, DEPENDABLE — One man does the work of many with VIBRA-TAMP. Self-propelled. Operates in any weather. Works flush against curbs, foundations, and walls. Simple design and quality construction keep the machine on the job day in and day out. Moving parts fully enclosed. Handle adjustable to comfortable height.

Ask for Catalog 630

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BARCO VIBRA-TAMP
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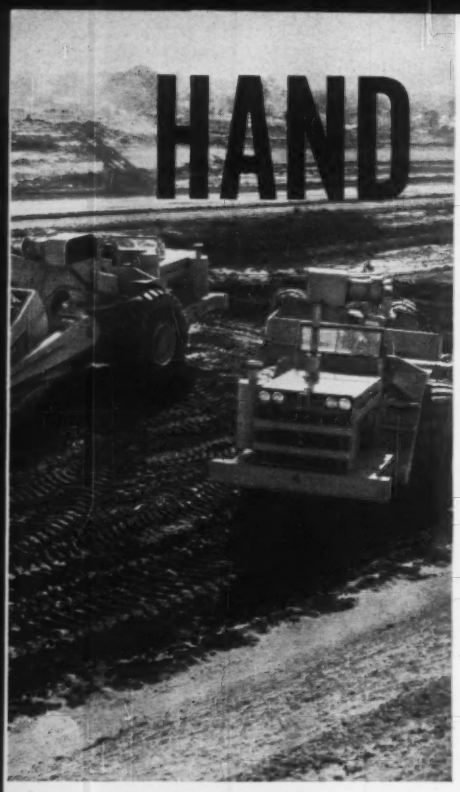


HAND SIGNALS

"Sign language" communications to help direct earthmoving equipment

The proper use of hand signals — between foremen and equipment operators — can eliminate many work interruptions that steal pay-yards from your production schedule. This system of communication permits conveying *emergency changes,* or *additions,* or *clarifications* of the verbal instructions given prior to an operation — at a distance, and above the roar of the big engines used on earthmoving equipment.

No matter where your foreman is on the cut, haul, or fill — if he is in visual range of the operator, and if standard signals are used and understood — he can signal the operator through the use of his hands, arms, and feet. The operator acknowledges he has received a signal by raising and waving his hand.

Here are the best-known, most widely used hand signals. They can help you increase safety, production, and profits.

1. The most commonly used signal in dirtmoving is for location and depth of cut or fill. Foreman indicates spot where he desires operator to begin cut or spread by pointing . . . or by throwing a rock or clod of dirt. Fingers raised indicate depth of cut or spread, in tenths of a foot — three fingers for 3/10′, and so on.

2. To indicate number of feet in final depth of cut or fill, foreman points with an up-and-down motion to his foot . . . at the same time holding up fingers of opposite hand, to indicate number of feet. For example: A combination of pointing to foot and two fingers raised, indicates that there are two feet to cut or spread in this area.

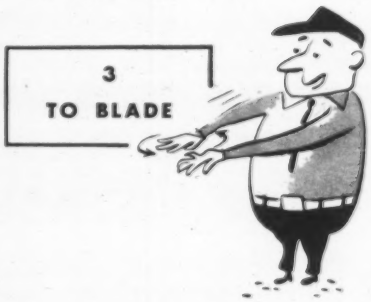
3. The signal to blade the cut, fill, or haul road, is conveyed by pointing out the area, and then rubbing the palms of the hands together horizontally . . . indicating a smoothing motion.

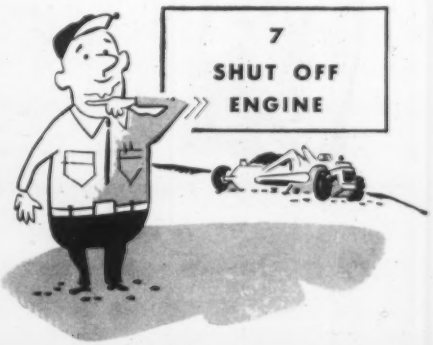
4. To hustle any operation, the signal used is to vigorously swing the raised right forearm in a circular motion.

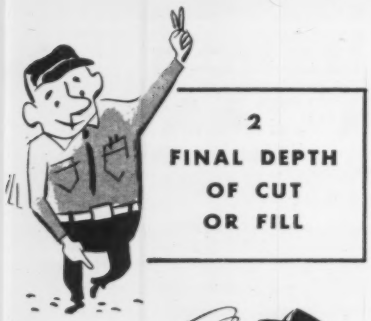
5. If there's danger ahead, operator can be signaled to stop immediately, by vigorously flapping arms vertically.

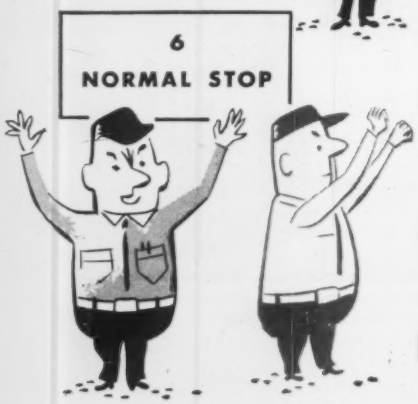
6. For normal stops or to hold up dirtmovers, both hands are raised, police wise, with palms up to the operator. To indicate that all rolling motion of the machine should stop, and brakes be held until a release signal is given, clench both fists.

7. "Cutting your throat" is a signal which is universally understood — kill your engine.



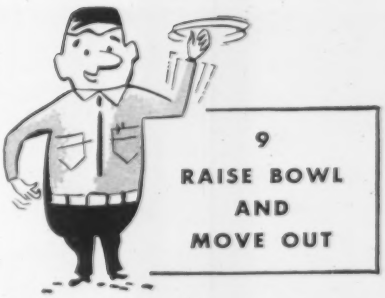


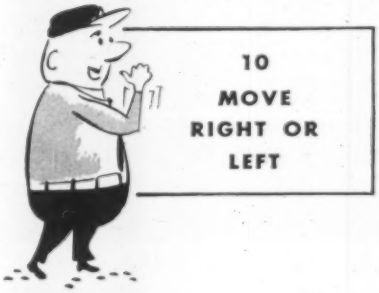




8. While making a cut or spread, it may be desirable to have the operator vary the depth. Indicate this by a lifting or lowering motion with the palm of one hand — depending on whether blade should be raised or lowered. Signals for tenths with fingers (see #1), indicate distance to raise or lower.

9. When cut approaches finished grade, and it is desirable to have the operator raise his partially-filled bowl and move out — indicated by a lifting, closing motion of the fingertips and hand. Follow immediately with the highball sign (sketch 4).

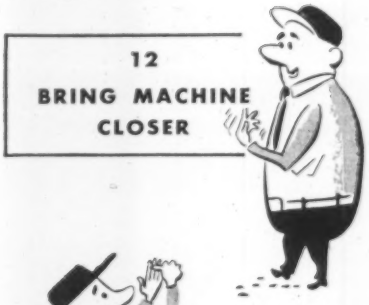




10. Should you want the scraper to move either right or left, a hitch-hiking motion with the thumb in desired direction is used.

11. When machine has shifted and is to resume straight-ahead travel, indicate by extending arms (below shoulders), and with palms turned down . . . the same motion used by a baseball umpire to indicate a player is "safe".

12. To bring machine closer to the foreman, a beckoning motion with one arm and hand is used. When maneuvering in close quarters, or to move only a foot or two at a time, both hands should be used indicating a slower, more cautious approach.



13. In case a machine becomes bogged down, and it is desired to signal another machine to assist the stuck machine, the fist of one hand is banged into palm of the other . . . then pointing to the machine to be pushed. The same signal applies to indicate that a certain specified scraper is to be push-loaded before another . . . or that the tractor or dozer is to push another piece of machinery, tree or boulder.

14. When it is desired to carry out an operation with extreme care, indicate by simply rubbing the thumb against the fingertips of other hand, and then indicating the desired motion.

15. For scarifying or ripping, the foreman can point or throw a stone at an area to be ripped, followed by a clawed hand in a digging motion.

16. Beyond hand signals, a handy trick is sometimes used by foremen on fine-grading operations. The foreman moves down the roadway ahead of the grader, checking the grade with a hand level. He then indicates the proper amount of cut, by laying a number of pebbles on the top of each stake corresponding with the tenths of foot to be cut. When he wants a cut of 2/10 foot, for example, he indicates this by laying two pebbles on the stake. This works fairly well up to a 4/10-foot cut, which in most instances covers all of the fine-grade operation.

Free reprints or large wall charts of this article on request. State quantity desired. If you know of any additional hand signals that we have not touched upon, drop us a line, describing those found to be effective on *your* operations.

1593-DC-2

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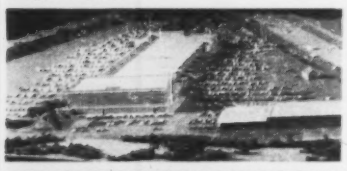
WELD-CRETE

Weld-Crete is the patented, job-proved liquid bonding agent which enables you to *permanently* bond new concrete, or cement plaster, *directly* to any other structurally sound surface no matter how smooth! No costly, time-consuming surface preparation. Just apply, let dry, and pour or trowel new concrete. Ideal for new construction, remodeling, repairs . . . *ramps, floors, precast shapes, driveways, highways, walls, machine mounts and pads.* Weld-Crete has equal bonding permanence all climates, all surfaces, all sorts of conditions. When used with quick setting cement topping you can lay new floors, ramps, driveways one day and run heavy truck traffic over them the next. Get fact-packed literature from your Building Materials Dealer, see Sweet's File, or write us direct. Address Larsen Products Corporation, Box 57561, Bethesda Maryland.

Typical **WELD-CRETE** Applications

GRANVILLE ST. BRIDGE, VANCOUVER, BRITISH COLUMBIA—One of the largest 8 lane bridges in North America. Here Weld-Crete was applied to bridge surface to bond cement dividing strips. Now, over 4 years later, bonds are as good as new. *General Contractor:* Dominion Bridge Company.



SEVEN CORNERS SHOPPING CENTER, FALLS CHURCH, VIRGINIA—During construction of this 600,000 sq. ft. structure, initially only part of floor was poured and floated to a smooth finish. Areas in which show windows would be added were poured as base slab only. Slab was coated with Weld-Crete. After store fronts were custom-built, delayed toppings of 1" to 1½" thick were poured with assurance of permanent bond to base slab. These toppings were then finished with asphalt tile, wood, or finish flooring of lessee's choice. Designed and constructed by The Kass Realty Co. of the Kass-Berger Organization under direction of J. Franklin Groff. *Concrete Contractor:* Moses-Ekco.

Craig P. Hazelet . . .

Old Methods Too Slow for Him

Craig P. Hazelet is, in his own words, bullish on engineering as a profession.

It is a profession to which the senior partner of the consulting firm of Hazelet & Erdal has devoted more than 40 years of his life. And, he says, his enthusiasm for the profession is just as great—if not greater—than when he graduated from college in 1915 or when he started his own firm in the depression years of the 30's.

"Today," says Mr. Hazelet, "the engineering field is undergoing a dynamic and exciting change. Old methods and procedures are too slow for our time. We're seeing great advances. It's a good time to be an engineer.

"When I talk to young men who are planning to study civil engineering, I tell them that if they want to make a lot of money they should go elsewhere. Sell insurance. But if they want to be truly professional men, and if they are willing to apply themselves, this is the field for them. The rewards are great. We are living in an engineering world and the horizon is unlimited."

• **Quiet, but**—Mr. Hazelet is a soft-spoken, gray-haired man whose natural quietness is reflected in his surroundings and in his office, but is a quietness that is belied by his great enthusiasm and almost legendary capacity for work.

From his office on the fourth floor of an office building in downtown Louisville—a location he selected during World War II for the simple reason that "I like it here"—he directs the operations of his firm both overseas and in four midwestern cities.

Pictures of bridges (his favorite projects) surround the room except for a space directly behind the senior partner's desk. In that space hangs a large and rather startling non-objective painting done by his daughter, Sally. The painting, he says, is also there because he likes it—he likes the lines, just as he likes the clean sweeping lines of a well-designed bridge.

A native of O'Neil, Neb., Mr. Hazelet grew up in Seattle, following his construction-man father. He grew up in what he likes to call an "engineering atmosphere", and attended the University of Washington. He took graduate work at Massachusetts Institute of Technology and the University of Illinois.

After holding various engineering jobs and spending a year in the Army in World War I, he returned to Illinois as an engineering instructor, leaving that post in 1921 to join the Scherzer Rolling Lift Bridge Co., of Chicago, as chief engineer in charge of operations. He became president of this company in 1930.

• **On your own**—In 1936, however, Mr. Hazelet presided over the liquidation of the Scherzer company and transferred its business to a partnership that he had formed with Ingolf Erdal, who had been chief design engineer for Scherzer. One of the two other men in the new organization was A. L. R.

D Tournapull gets heaped load of sandy topsoil at roadside stockpile near U.S. 85 and 87, ten miles north of Colorado Springs, Colo. Material was used to landscape roadside along new highway.

shouldering – topsoiling – finishing

contractor finds way to make landscaping profitable

Roadside areas along a newly relocated portion of U.S. highways 85 and 87, leading to the U.S. Air Force Academy 10 miles north of Colorado Springs, Colo., were in need of landscaping. The work entailed some shouldering and drainage repair, but mostly it was a job of hauling in topsoil from a stockpile, spreading the material in thin lifts over long, narrow, roadside areas, then finish-grading and seeding.

Which tools to use?

Obviously, this was no work for big production scrapers, nor was it a suitable application for slow-moving crawler-scraper combinations. The answer to this problem was supplied by National Landscaping Co. of Palatine, Ill., and Colorado Springs, Colo., who took the contract. The company decided the best way to handle this shouldering-topsoiling-finishing assignment was with fast-loading, fast-hauling 138 hp LeTourneau-Westinghouse D Tournapulls®.

Here's a typical example of D 'Pull* performance on this job: At the stockpile, each machine was push-loaded to an estimated average 7 pay-yds. of mixed sand and topsoil, then hauled 3000-3300′ and spread beside the divided highway in controlled lifts with runs over 200-300′. Machines had the advantage of a 15-22% downgrade for a short distance leaving the stockpile, but had to back-track empty over the same route. Machines made complete 6620′ cycles in about 6 minutes.

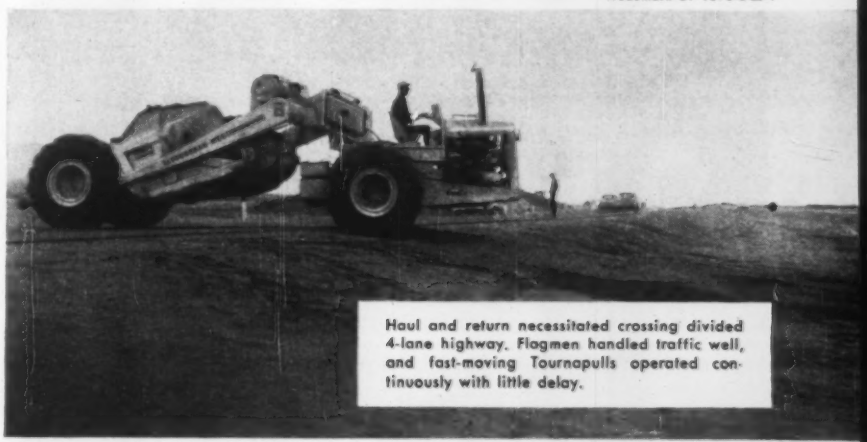
"Well suited to our work"

This was what John Slattery, Vice President of National Landscaping Co., had to say about the rigs. "D Tournapulls are easy to maneuver, and dependable," he added. And Superintendent Gaylord Shrock said, "This equipment is giving good service, keeping us about 5% ahead of schedule." Lowell Pugh, Operator, adds, "In my 20 years' experience, I prefer Tournapulls. I like them best because of their easy operation with electric controls."

New D 'Pull even better

The 'Pulls used on this contract were of the 7½-cu. yd. heaped capacity. The machines available now have 9 cu. yds. capacity, with 8-ft. width and 9-ton axle load limits to road anywhere without permit. Ask for complete details.

*Trademark DP-1596-DCJ-1



Haul and return necessitated crossing divided 4-lane highway. Flagmen handled traffic well, and fast-moving Tournapulls operated continuously with little delay.

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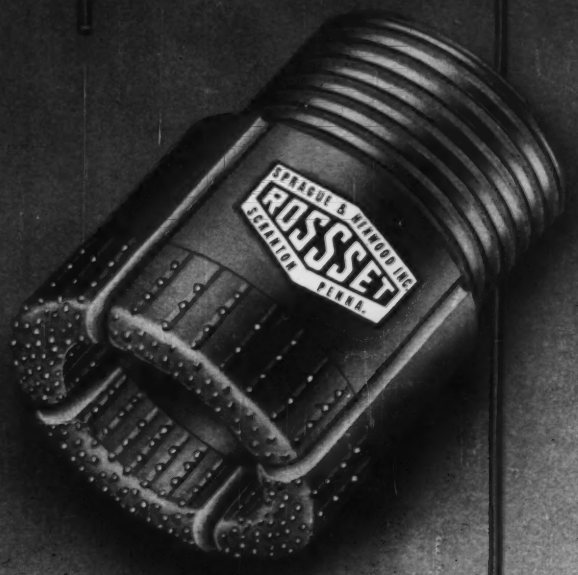

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Write today, giving all information you can provide. We will be glad to recommend the bit we believe to be the best suited to your drilling conditions. Always order or specify SPRAGUE & HENWOOD "Oriented" Diamond Bits. For the complete diamond bit story, write for our Diamond Bit Catalog No. 320-1.

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Sanders, a former Hazelet student at the University of Illinois. Mr. Sanders is now a partner in Hazelet & Erdal and heads the Chicago Office. Mr. Erdal has retired.

The fledgling engineering firm found it rough going for the first few years. "We were just emerging from the depression, and there didn't seem to be any work," Mr. Hazelet recalls.

However, in 1938, a major break came. The firm submitted a design for an elevated highway, in a competition sponsored by the American Institute of Steel Construction. The design featured a central support for an elevated road—a novel idea at the time that soon was put into wide use. Most importantly, however, the design won first prize and the $5,000 cash award was a welcome income for the struggling firm.

Mr. Hazelet took his share of the money, went to Florida on vacation, but he came back with some more business for the firm. New jobs followed—including foreign work. The firm had submitted a competitive design for a bridge in China, which was accepted. Other jobs were completed in France, Spain and England.

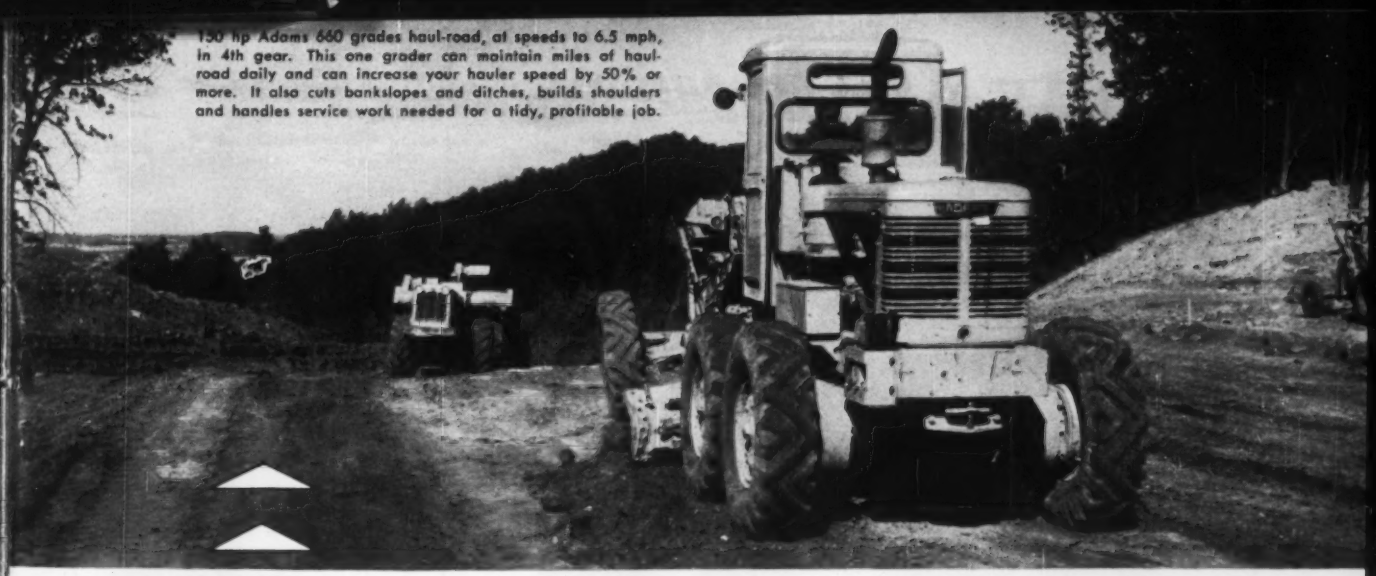
• **Expansion**—Hazelet & Erdal designed shell loading plants, test laboratories for the Air Corps, and then went into marine work for the Army's Transportation Corps.

In this latter work, the Army urgently needed cranes, barges, tugs, small tankers and the like to support activities in the Pacific. Hazelet & Erdal set up operations in Cincinnati, and at one time had 200 men on its staff there. It even went so far as to organize a school of naval architecture to orient the men the firm had hired in terminology and technique.

After the war, the firm went back to bridges and highways, its first love. Some of these in recent years have included the Veterans Memorial Bridge at East St. Louis, Ill.; two structures at Bay St. Louis and Pascagoula, Miss.; and bridges at Parkersburg and Dunbar, W. Va.

Projects in the works now include the Detroit-Toledo Expressway; the Calumet Skyway toll bridge, and a section of the Illinois tollroad; the Detroit Edsel Ford Expressway; and Louisville's North-South Expressway.

• **Organization**—Besides Mr. Hazelet and Mr. Sanders, there are five other partners in the firm, all of them longtime associates. One of them, John H. Clark, III, is Hazelet's son-in-law. The others are Robert H. Wood; Lewis G. Hexem; Frederick A. Reickert and F.



150 hp Adams 660 grades haul-road, at speeds to 6.5 mph, in 4th gear. This one grader can maintain miles of haul-road daily and can increase your hauler speed by 50% or more. It also cuts bankslopes and ditches, builds shoulders and handles service work needed for a tidy, profitable job.

How haul-road maintenance can increase your profits

The hauling phase of your scrapers or trucks accounts for the largest percentage of time on most dirtmoving cycles. With a planned haul-road maintenance program — handled by 1 man, 1 grader, a few hours each day — you can cut cycle time and add bonus dollars to your profits. Here's why:

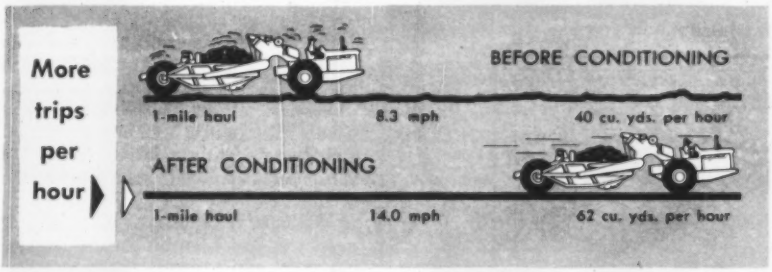


Diagram shows how regular maintenance on a 1-mi. haul-road permits scraper to travel 69% *faster*. Result: more trips, for a production increase of 55%, or 22 yds. per hour.

At pay of only 30c per yard, for example, the scraper hauling on the maintained road earned an extra $6.60 per hour. Multiply this by a fleet of 6 scrapers, 10 hours a day, 6 days a week, and you have a "bonus" of $2,376 per week. So haul-road maintenance doesn't really cost — it *saves* and *earns* for you!

Prolongs equipment life

In addition to increased production, haul-road maintenance also prolongs the life of your equipment fleet . . . lowers servicing and repair costs, and downtime. Take tires alone — damaged from sharp objects, chuckholes, etc., due to poor haul-road maintenance — can cost you thousands of dollars per year for recaps and replacements. All mechanical parts of your haulers are similarly subjected to extra stress and wear. For a fraction of the cost of extra servicing and increased depreciation due to hauling over rough haul-roads, you can easily pay cost of 1 man, and 1 grader to keep these roads hard, smooth, level, and well drained. Also, your maintenance grader can help out with other grading, sloping, and ditching jobs — keeps profitably busy at all times.

High operator efficiency

Your operators will work more relaxed, less fatigued, when traveling over smooth haul-roads. That means they work faster, steadier . . . more productively, all day long.

More grader for your dollar

When planning the purchase of a grader, it will pay you to investigate Adams* heavy-duty motor graders, built by LeTourneau-Westinghouse. All 6 Adams models (60 hp to 190 hp) give you a wider range of power and speed than competitive graders of comparable weight and horsepower. They can push bigger, heavier loads . . . make deeper cuts faster . . . finish-grade more accurately. Choice of GM or Cummins engines on 5 larger models. The largest and most powerful is the 190 hp POWER-*Flow** 660, with torque-converter drive. Write for a demonstration. No obligation.

*Trademark G-1546-DC-1

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TRU-LAY *flexible* PUSH-PULLS

FOR

Remote Control Jobs

on a great variety of

Construction Equipment

Adaptability to all sorts of mechanical situations explains, in large measure, the wide-spread use of TRU-LAY PUSH-PULLS on tractors and their accessories, power shovels, winches, road graders, road oilers, dump trucks, snow plows, engine-driven pumps, rock crushers and other construction equipment.

These dependable Push-Pulls are used for the remote control of hydraulic and air valves, brakes, clutches, transmissions, throttles, chokes, governors, power take-offs, and many other applications.

TRU-LAY PUSH-PULLS are precision products, not gadgets. They provide positive remote-action whether anchorages are fixed or movable . . . for light loads or loads up to 1,000 lbs. . . . and they are effective over short or long distances, up to 150 feet or more.

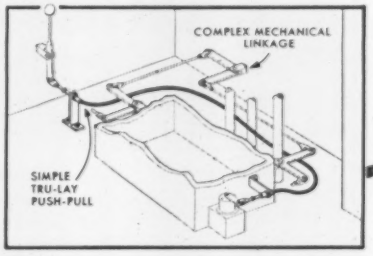
TRU-LAY PUSH-PULLS are dependable and accurate even under the most adverse conditions

They perform effectively under extremes of heat or cold . . . from jet engine temperatures to 70° below zero F. The inner, working member (lubricated for life during assembly) is fully protected by the tough, flexible conduit. Abrasive dusts, dirt and moisture are sealed out. Fittings are cold-swaged to make them integral parts of the control unit. It is a matter of record that we have never heard of a TRU-LAY *flexible* PUSH-PULL wearing out in normal service. Use of these versatile, simple and rugged controls increases ease of operation and means the virtual elimination of maintenance.

Advantages of Tru-Lay Push-Pull flexibility and simplicity are pictured below

Simplicity vs Complexity

Compare the TRU-LAY PUSH-PULL cable in illustration with the mechanical linkage. PUSH-PULLS are simple, have but one moving part, are noiseless and give lifetime service accuracy. Linkages are complex, made of many parts; they wear at many points. Their use brings increased backlash, lost accuracy and vibration rattles.



"Solid as a rod but *flexible* as a wire rope" is a good description of TRU-LAY PUSH-PULL REMOTE CONTROLS. This flexibility makes it possible to snake around obstructions . . . permits the ideal arrangement of all control elements . . . greatly simplifies installation of controls by reducing the number of working parts . . . damps out noise and vibration. Versatile, accurate, adaptable, rugged . . . they are the ideal remote controls for construction equipment.

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Spencer Weber. A partner is in charge of each of the four field offices—at Louisville, Cincinnati, Chicago and Lansing. Design load and personnel are shifted from office to office as work demands, but by particular design each office is given a great deal of independence to lessen the dependence on headquarters in Louisville.

Actively concerned with recruiting a continuing flow of well-trained young men, Mr. Hazelet has made a policy of talking with seniors and universities such as Illinois, Michigan, Kentucky, Louisville and Cincinnati and corresponds with groups at other schools.

As an encouragement to civil engineering students, the firm also has established scholarships for upper classmen at the University of Kentucky and the University of Louisville.

And, on this subject, Mr. Hazelet has a resounding word to say about the new generation of students. He says that the engineers graduating now from colleges and universities are "an assured group who have a much stronger educational background" than those of his own generation.

Careers

Public Works

Henry Van Loon, architect and economist, has been appointed executive director of the Pennsylvania State Planning Board. Mr. Van Loon, who has 25 years of experience in city planning, housing and economic area studies, has made development studies for the State of Minnesota and for major cities such as Pittsburgh, Chicago, San Francisco.

Walter Deller has been named Campbell County, Ky., engineer. He is a civil engineering graduate of the University of Cincinnati and Purdue University.

William H. Lindsay, Jr., civil engineer who has been an assistant district engineer with the Pennsylvania Railroad, has been named to head the Division of Buildings in the Philadelphia Department of Licenses and Inspections. He will supervise three subagencies that enforce laws relating to zoning, building construction and mechanical services.

Elmer F. Stansberry, former engineer with Ralph L. Woolpert Co., Dayton, Ohio, has been named administrative assistant to the city manager of Dayton. He succeeds **Earl Sterzer**, newly appointed Dayton urban renewal administrator.

Samuel F. Moore will retire January 1 as city engineer of Miamisburg, Ohio, a post he held since 1944. **Charles R. Alkire** will succeed him.

Building 60′ fill

Colorado contractor moves tough-loading material over mountainous grades

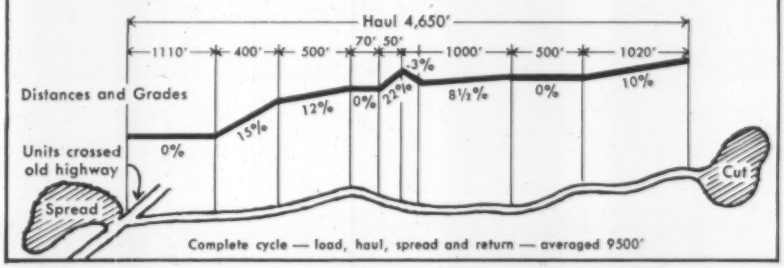
Working at high altitudes, powerful Twin-C quickly push-loads B Fullpak with rocks and gravel, on relocation of 9.3 miles of U.S. 160 near Ft. Garland, Colorado. Equipped with optional electrotarders for additional *nonwearing* braking action, 'Pulls* were able to be slowed to a "walk" without use of service brakes.

Stephenson Logging and Construction Co., Denver, contracted to relocate 9.3 miles of U.S. 160 near Ft. Garland, Colorado. The contract included earthmoving, grading, excavating, pipe, structures and fence.

To move the 792,000 yds. of tough-loading rock, clay, and gravel over mountainous grades, contractor chose this fleet of rubber-tired LeTourneau-Westinghouse earthmovers . . . Three B Tournapulls® with 27-yd. Fullpak* scrapers; Four C Tournapulls — two with 18-yd. Fullpak scrapers and two with older 16-yd. scrapers; and a 420 hp Twin-C* tractor. Here are performance figures while building a 60′ fill, and making a cut 45-50′ deep, and traveling a 9,500′ cycle:

	B Tournapulls	C Tournapulls
LOAD TIME 150′ Push-loaded with rocky material by Twin-C tractor	58 sec.	52 sec.
HAUL 4,650′**	3 min. 23 sec.	3 min. 42 sec.
SPREAD 50′	47 sec.	45 sec.
RETURN 4,650′**	4 min. 7 sec.	3 min. 48 sec.
TOTAL CYCLE TIME	9 min. 15 sec.	9 min. 7 sec.
PAY-YARDS PER UNIT	18 yds.	Fullpak — 12 yds. Old "C" — 11 yds.
PAY-YARDS PER HOUR PER UNIT	108 yds.	Fullpak — 72 yds. Old "C" — 66 yds.

**Tournapull scrapers were hauling down, returning up these 3 to 22% grades.



"They really move yardage"

Co-owner Gus Gravina says, "Tournapull scrapers are easy to load. They get out and go . . . really move yardage. The Twin-C is a real good pusher, too!" Operators also had high praise for the L-W equipment. Commenting on the new B Fullpak, 18-year veteran operator Len Bragg said, "The 'B' loads real easy. I like the electric controls . . . handles and rides nice. You can't beat it for a full day's work."

Saves time, money, on job-to-job moves, too

Owner also makes good use of Tournapull's high speed when moving job-to-job. 30 mph C Fullpaks drove to job from Colorado Springs — a distance of 150 miles, through traffic and over steep grades — in 8 to 10 hours.

Speed your dirtmoving jobs

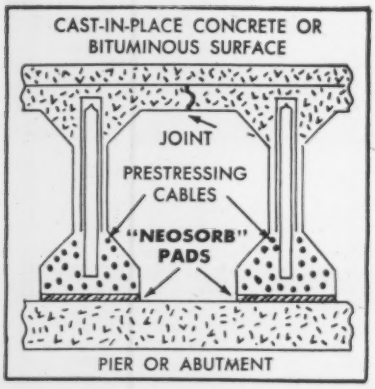
For fast, efficient dirtmoving — of any material, on any length haul — you'll find LeTourneau-Westinghouse pushers and Tournapull scrapers top them all. Why not let us arrange to show you an 18-yd. "C" or 27-yd. B Fullpak at work? Write for full details.

*Trademark BPCPTW-1587-DCJ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



NOW AVAILABLE...

VOSS

"NEOSORB"

BRIDGE & STRUCTURAL BEARING PADS

Special composition, specially cured Neoprene Bearing Pads are rapidly being adopted by state highway departments for bridge and overpass construction. With either prestressed concrete or steel beams, VOSS "NEOSORB" Bearing Pads offer distinct advantages over older approaches to the bearing problem; they replace mechanical bearings, give full-beam conformation, prevent electrolysis when used under aluminum railings.

They meet such requirements for an acceptable beam bearing as: (1) uniform transfer of load from beam to substructure; (2) accomodation to deflection of beam under load by beam rotation at the bearing; (3) allowance for changes due to temperature variation and shrinkage, by permitting lateral and longitudinal movement of the beam; (4) reduction or elimination of maintenance; (5) durability, including resistance to ozone deterioration during aging. And of course, they cost *considerably* less than most metal or combination bearings.

• Voss "NEOSORB" Bearing Pads are made of the finest materials, to the controlled formulae required for heavy-duty construction use, and supplied to exact dimensional specifications according to existing state standards. If and when new standard specifications to be applied nationally (now under consideration by AASHO) are adopted, Voss will immediately begin production of "NEOSORB" Bearing Pads to the new specs. If you are on our mailing list, you will get "flash" information about any such adoption of new standards.

*Call on Voss for any information or assistance you need regarding Bearing Pads and Preformed Fabric Pads for beam seating, vibration and shock damping, etc., in any construction application. You can be sure of our closest cooperation.

Send for samples and data today!

PREFORMED PAD DIVISION

VOSS BELTING & SPECIALTY CO.

5645 N. RAVENSWOOD AVE., CHICAGO 26, ILL.

Unit Prices

Price Breakdown on Wisconsin Phone Line

Separate prices on labor and materials for 198 miles of telephone lines distinguishes the $234,065 Rural Electrification Administration contract to Zontelli Construction Co., Ironton, Minn. by Citizens Telephone Coop., Inc., for work in Barron and Chippewa Counties, Wis. The engineer is Carl C. Crane, Inc., Madison, Wis.

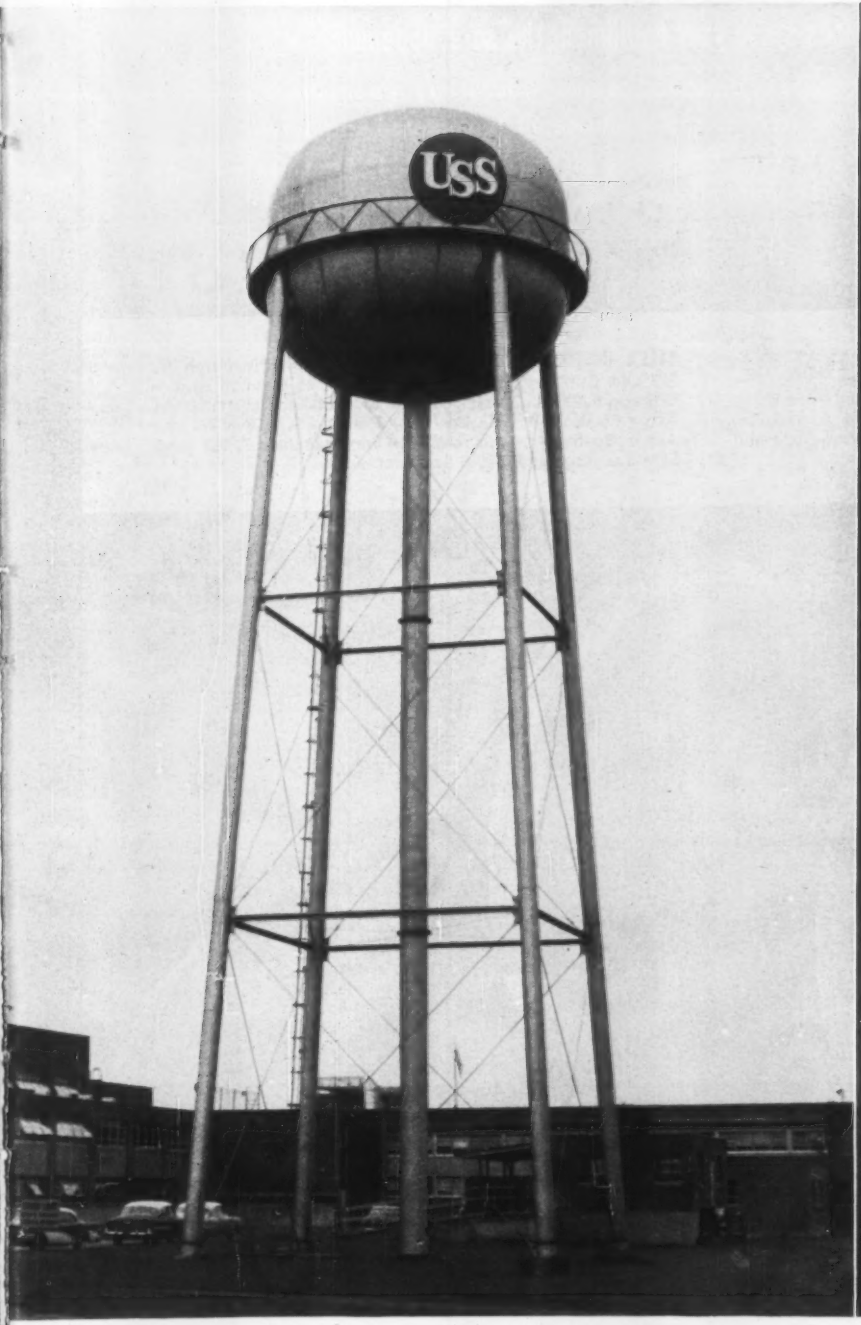
Approximate wages prevailing on this job range from $1.75 for common labor to $2.50 for skilled.

1C	Zontelli Construction Co., Ironton, Minn.	$234,065
2	Honold & Fove, Sheboygan, Wis.	237,429
5	Commonwealth Const. Co., Pierz, Minn.	255,378
EE	Carl C. Crane, Inc., Madison, Wis.	230,000

Bids: 9-5-57 Items	Unit	Quantity	Unit Prices 1C Labor	Material
Poles in place				
Class 10, 20 ft	au	1,000	$5.50	$4.75
9	au	620	6.45	6.40
7	au	430	6.65	7.40
10, 25 ft	au	600	6.50	7.00
9	au	270	6.65	8.90
7	au	280	6.75	11.55
6	au	2	7.25	14.00
9, 30 ft	au	3	7.75	11.90
7	au	20	8.75	15.50
6	au	10	9.75	18.50
6, 35 ft	au	14	12.75	25.00
Pole top, brackets same side of pole				
1 circuit on clevises				
DE arrangement on corners, 2 verticle	au	75	2.25	2.95
1 verticle DE	au	60	1.75	1.55
Pole top, crossarm type				
crossarm, tp 2A, 2 pin	au	1,400	0.75	0.80
with brace	au	100	2.00	1.20
6A, 6 pin single	au	420	1.25	3.70
double	au	10	3.50	8.40
sidearm, 6A, 6 pin single	au	11	5.00	6.50
crossarm, 10A, 10 pin single	au	527	1.50	5.80
double	au	20	5.00	12.50
DE, 2 single	au	20	6.00	10.80
single	au	20	3.00	5.40
DET, DE with back truss, 2 single	au	20	8.00	23.70
single	au	20	6.00	11.85
sidearm 10A, 10 pin single	au	20	4.00	9.50
Aerial cable, lead covered, plastic insulated and sheathed, supported by 6000 lb strand				
24 gage, 11 pair	au	0.280	80.00	171.35
16	au	10.370	80.00	199.40
26	au	36.300	80.00	251.25
51	au	10.170	80.00	390.15
76	au	0.310	150.00	519.35
152	au	0.350	150.00	955.95
303	au	0.610	150.00	2,321.90
22 gage, 26	au	16.747	80.00	294.70
51	au	22.940	80.00	485.45
101	au	0.870	150.00	833.65
Multi-pair distribution wire units				
19 gage, 6 pair	ea	0.780	$100.00	$163.65
Wire - HTL 135	au	*2,600	5.50	6.05
down guy, 2.2M strand	au	430	2.00	2.20
6M	au	530	2.25	4.20
10M	au	40	2.75	5.70
overhead guy, 2.2M str.	au	10	4.50	3.95
6M	au	10	6.50	7.30
Anchor, patent, 4000 lb	au	530	4.00	3.50
6000 lb	au	580	4.00	4.95
10,000 lb	au	40	5.00	7.50
Cable terminal, strand mounted with plastic stub				
unprotected, 11 pair	au	59	35.00	22.60
16	au	3	35.00	23.95
protected, 11	au	10	35.00	30.95
16	au	8	35.00	36.15
26	au	4	35.00	54.35
Multi-pair distribution wire terminals, pole mounted				
unprotected, 6 pair	au	1	20.00	4.50
protected, 6 pair	au	1	20.00	16.45
Loading coils in lead sleeve case with plastic insulated cable stub, strand mounted				
15 pair	au	5	45.00	108.65
26	au	7	45.00	173.10
Cable splicing, complete	au	12	25.00	10.00
Wire work to random and/or test splice 100 cable pairs in any cable, complete	au	10.3	100.00	10.00
copper covered stl, drop, parallel, #18 AWG	au	90	47.50	50.65
outside distributing #14, AWG (.064)	au	2	50.00	56.00
Pole ground assembly	au	40	3.00	1.10
Bonding wire assemb for bonding aerial cable str to elec syst neutral, cable str on same pole, or pole ground assembly	au	35	1.00	0.60
Cable extension arm (short)	au	3	5.00	15.60
(long)	au	7	5.00	27.35
Pole stepping unit per pole (cable)	au	76	4.00	3.90
Guy guard	au	50	$1.00	$4.10
Central office cable entrance (aerial) incl cables, splices, placing, fanning, lacing, soldering, bonding, complete	au	2	350.00	150.00
grounding system, incl ground electrodes, trenching, bkfl, bonding electrodes to each other and to main frame & elec system ground	au	2	60.00	27.50
Conc slab for mounting outside pay station booth	au	2	25.00	10.00
Protector assembly units outside station (pipe system ground)	au	200	2.50	3.00
electric system ground	au	200	3.00	2.55
ground rod	au	192	3.00	3.35
lightning arrestor, with bridle wires, grounding wire, hdwe, single pair	au	10	3.00	2.55
five pair	au	31	5.00	7.10
open wire power contact, with bridle wire & hdwe single pair	au	40	3.00	3.50
five pair	au	10	4.50	19.50
Right of way clearing, measured each side of pole				
1000 ft long, 5 ft wide	au	55	72.50	....
10	au	55	92.50	....
measured both sides of pole				
1000 ft long, 10 ft wide	au	55	100.00	....
20	au	55	130.00	....
Tree trimming to provide 5 ft clearance, 1000 ft	au	55	115.00	....
Telephone set assembly, 5 db improved, desk type with conn block, dial	au	295	4.50	30.00
wall type, dial	au	295	4.50	30.00
pay station, dial, semi-postpay	au	2	10.00	160.00
Pay station booths, full length outside	au	2	30.00	450.00
Station wiring, 3 conductor	au	592	4.00	2.50
Pin & insulator units (incl transposition and DE units)				
2 wood pins & insulators	au	3,360	0.20	0.75
2 long shank stl pins, ¾"	au	20	0.70	1.75
2 wire transposed wire supp, wood pin & double-groove insulators	au	1,200	0.65	0.95
long shank pins & double groove insulators, ¾"	au	10	0.90	1.95
flat DE with clevises & spool insulators	au	57	1.00	1.65
tandem bracket with double-groove insulators & short shank stl pins, 1 light duty; 1½" pin	au	820	1.00	2.30
1 heavy duty ⅝" pin	au	10	1.25	3.00
Bracket type pole top units on one side of existing poles, 1 circuit on clevises, 2 vertical DE arrangements at corner	au	20	3.50	3.15
1 verticle DE	au	60	2.50	1.65
Crossarm type pole top assembly on existing poles				
tp 2A, 2 pin	au	150	2.25	2.80
with brace	au	5	2.75	1.20
2B, sidearm single	au	150	3.00	1.70
Guy assembly on existing poles, down, ground conn type 2.2M strand	au	100	2.25	2.80
6M	au	30	2.00	4.80
10M	au	9	3.00	6.35
down, 2.2M strand	au	2	2.25	2.25
6M	au	2	3.00	4.20
10M	au	2	3.00	5.75
down, strain insulator type 10M strand	au	3	5.00	8.25
16M	au	2	6.00	13.70
Wire assembly on existing poles HTL 135	au	226	6.00	6.05

Completion schedule: 150 calendar days
Liquidated damages: $50/day
au assembly unit
DE dead end * with vibrator damper

FOR UNITED STATES STEEL'S
NEW RESEARCH CENTER AT MONROEVILLE, PA.



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Providing a dependable supply of water at uniform pressure for a wide range of uses found in a great industrial laboratory, this Pittsburgh-Des Moines Elevated Steel Tank also assures ever-ready fire protection for U. S. Steel's extensive central research plant. Of double-ellipsoidal design, the tank is 150,000 gallons in capacity, 34 ft in diameter on a 100 ft tower, and has a headrange of 21 ft 10 in. Write for the descriptive PDM Elevated Tank Catalog, detailing various types and sizes for every water storage requirement.

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ELEVATED STEEL TANKS

WHYTE STRAND WIRE ROPE

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Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel and Plastic Coated Wire Rope, and Wire Rope Assemblies. Special catalogs available.

MILL DEPOTS: **New York 4,** 35 Water St. • **Pittsburgh 36,** 353 Old Curry Hollow Road • **Detroit 3,** 75 Oakman Blvd. • **Chicago 6,** 228 S. Desplaines St. • **St. Paul 14,** 2356 Hampden Ave. • **Ft. Worth 1,** P.O. Box 605 • **Portland 9,** 1603 N.W. 14th Ave. • **Seattle 4,** 87 Holgate St. • **San Francisco 7,** 188 King St. • **Los Angeles 21,** 2035 Sacramento St.

Materials and Labor Prices

Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, Dec. 19: Next, Jan. 23
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Dec. 26: Next, Jan. 30
- Wage Rates, Building Board, Lath, Insulation: Last, Jan. 2: Next, Jan. 30
- Cement, Aggregate, Ready-Mixed Concrete, Asphalt: Last, Jan. 9: Next Feb. 6

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES—	PLATE CARBON STEEL	REINF BARS* billet	RIVETS ½-in. struc-tural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	STEEL RAILS Per Net Ton Light	TRACK SUPPLIES Angle Bars	TRACK SUPPLIES Std Spikes	TRACK SUPPLIES Tie Plates	TRACK SUPPLIES Track Bolts
Birmingham Area	$5.275	$5.10	$5.425	$12.25	.....	$110.50	$130.00	$6.975	$9.75	$6.60	.....
Chicago Area	5.275	5.10	5.425	12.25	$6.225	110.50	130.00	6.975	9.75	6.60	.....
Pittsburgh Area	5.275	5.10	5.425	12.25	6.225	110.50	130.00	6.975	9.75	6.60	$14.75
Buffalo Area	5.275	5.10	5.425	12.25	6.225	110.50	130.00	6.975	9.75	6.60	14.75
Cleveland	.....	.....	5.425	12.25	6.225	.....	.....	.....	.....	.....	14.75
Youngstown Area	.....	.....	5.425	.....	.....	.....	.....	.....	9.75	.....	.....
Geneva	5.275	5.10	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles	5.975	.....	6.125	.....	6.225	.....	.....	.....	9.75	6.75	.....
Pueblo	.....	.....	.....	.....	.....	.....	.....	69.75	9.75	6.60	.....

* Fairless Works, $5.575.

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS Per 100 lb., base price 5 tons to carload lot New billet	REINFORCING BARS Per 100 lb., base price 5 tons to carload lot Rail steel	EXPANDED METAL LATH‡ Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	EXPANDED METAL LATH‡ Per 100 sq. yd., carload lots Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fob mill
Atlanta	$9.05	9.25	$9.01t	$52.00	$57.00	
Baltimore	9.45	8.45j	.....	42.00	46.50	
Birmingham	8.64y	8.60y	8.60y	57.00p	63.00p	
Boston	9.63a	8.25	8.25	46.50	51.00	
Chicago	8.79g	6.91gu	6.91gu	52.00‡	53.00‡	
Cincinnati	9.18ak	9.09re	.....	43.50mn	48.00mn	
Cleveland	9.01	8.89c	.....	44.50‡	49.00‡	
Dallas	10.25	8.50	8.50	44.00	48.50	
Denver	9.90	8.95c	.....	57.00n	63.00n	
Detroit	9.18	7.15g	.....	45.00	49.50	
Kansas City	9.31a	8.10	.....	49.00	50.00	
Los Angeles	7.75fd	7.35	.....	57.00	63.00	
Minneapolis	9.08d	9.25b	9.25b	42.50	46.00	
Montreal	8.70–9.00aC/8.30–9.40A	7.00/7.50F	7.00/7.50F	55.70hk	70.20hk	
New Orleans	.....	8.00yks	.....	45.50	50.00	
New York	9.45x	8.35y	8.35y	50.50n	57.00mo	
Philadelphia	8.80/9.00	7.80/8.00	.....	42.50‡	47.00‡	
Pittsburgh	8.64y	7.10y	.....	46.00‡te	49.50‡te	
St. Louis	9.10e	8.45c	8.45c	61.00f	62.00f	
San Francisco	9.50	9.45j	.....	51.00	55.00	
Seattle	9.80nD	8.85e	.....	62.00mr	68.00mr	
Toronto	8.85*	7.85	7.85	61.60nq	66.00nq	

Quantity extras, per cwt: under 100#, +$9; 100-399#, +$6; 400-999#, +3.50; 1000-1999#, +1.00; 2000-4999#, base price; 5000-9999#, —10¢; 10,000-19,999#, —30¢; 20,000-29,999#, —50¢; 30,000# and up, —70¢

EXTRAS, per cwt—♦Quantity (applies to L/L shipments only): under 1,000#, +$1.80; 1000-1999#, +$1.50; 2000-4999#, +$1.20; 5000-9999#, +90¢; 10,000-19,999#, +60¢; 20,000-29,999#, +30¢; 30,000-39,999#, +10¢; 40,000# & up, none. ♦Size†: #2 +$2.50; #3 + $1.40; #4 + $1.00; #5 +70¢; #6, #7, #8, #9, #10, #11 +50¢. ♦Bending: heavy, +90¢; light +$2.20 (except in New York City and surrounding metropolitan area where bending must be done on the job). ♦Engineering (details and placing from designs by others): over 500 tons, +45¢; 200-499 tons, +50¢ but not over $4500; 75-199 tons, +65¢ but not over $975; 5-19 tons, +85¢ but not over $300; under 5 tons, +$1.00 but not over $85. Min. charge $25. Design only: +60¢.

*‡ Delivered. ** Aver. of Canadian & American. *a 2000-9999#. *b 10,000-15,999#, fob city *c 20 tons or over *d 10,000-19,999# *e Intermediate struct'l *f Incl. delivering in free zone *g CL *h list price; dominion tax exempt; add provincial and municipal taxes *i add dominion, provincial and municipal sales taxes *j intermediate and hard grade *k fob city *l delivered; contractor to do unloading *m copper alloy *n LCL *o asphalt coated *p del. of 500 sq. yd. or more. *q 3 lb *r 2% off for cash *s 2,000-4,999# *t add 16.5¢ del. *u add 8.25¢ switch *v incl 15¢ del. *w truck lots. *y add 15¢ del. *z add 10¢ del. *A American made. *C Canadian made. *D 1½% for cash. *E 30,000# or over. * F Federal tax exempt.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE PRICE INDEX‡	ASBESTOS CEMENT PIPE per lin. ft. f.o.b. city 6" Pr Cl. 150	ASBESTOS CEMENT PIPE per lin. ft. f.o.b. city 12" Sew Cl. I	CLAY SEWER PIPE Per ft., delivered ASTM C13-54 8 in.	CLAY SEWER PIPE Per ft., delivered ASTM C13-54 12 in.	CLAY SEWER PIPE Per ft., delivered ASTM C200-55T 24 in.	CLAY SEWER PIPE Per ft., delivered ASTM C200-55T 36 in.	CLAY DRAIN TILE† Per 1,000 ft., car load lots, f.o.b. ASTM C4-55 6 in.	CLAY DRAIN TILE† Per 1,000 ft., car load lots, f.o.b. ASTM C4-55 8 in.	CONCRETE SEWER PIPE§ Per ft., delivered ASTMC 14-55 12 in.	CONCRETE SEWER PIPE§ Per ft., delivered ASTMC 14-55 24 in.
Atlanta	130.5	$1.64	$2.68	$.53	$.98	$.....	$.....	$334.00g	.....	$1.55m	$4.40m
Baltimore	140.4	1.64	2.46	.665	1.28	5.08s	12.71	187.80	$289.20	1.01	2.75m
Birmingham	125.8	1.64	2.68	.46	.86	3.70w	10.37w	260.00‡	440.00‡	1.25m	2.75
Boston	143.5	1.66	2.46	.763qrt	1.4715qrt	6.075qrt	.....	215.40r	330.60r	1.56mg	3.47mg
Chicago	140.9	1.64	2.46	.93m	1.7km	7.52m	21.16m	220.00n	330.00n	1.30	4.00
Cincinnati	135.5	1.66	2.55	.665l	1.2825l	4.905l	12.505	240.00	370.00	.85m	3.25m
Cleveland	141.7	1.66	2.55	.567s	1.0035s	4.545l	11.7875l	155.40m	240.60m	.85m	3.50m
Dallas	137.8	1.66	2.80	.537	.955	4.382b	9.72b	.....	.....	1.04	2.10
Denver	148.2	1.73	2.80	.48n	.87n	3.73n	.....	.....	.....	.75m	2.75m
Detroit	142.1	1.66	2.55	.90n	1.70n	6.80n	18.50n	164.80m	254.20m	1.10	4.05
Kansas City	138.5	1.66	2.55	.61	1.105	5.214b	11.08	275.00	485.00	.95	2.90
Los Angeles	148.6	1.73	2.46	.746bl	1.616bl	6.426bl	15.366bl	370.00l	530.00l	1.12	3.32f
Minneapolis	149.9	1.68	2.68	.86mo	1.55mo	6.70mo	.....	.....	.....	2.13hk	5.74hk
Montreal	.....	.....	.....	1.13u	2.00u	7.50u	13.50u	288.00	545.00	1.17hk	3.11j
New Orleans	133.3	1.64	2.68	.528	.983	5.10	.....	210.50p	468.00	.85	2.90
New York	138.7	1.66	2.46	1.02	1.94	7.56	19.48	.....	.....	1.50	3.00
Philadelphia	138.0	1.64	2.46	.68	1.31	5.13v	14.25v	300.00‡	350.00‡	1.75hk	4.20hk
Pittsburgh	142.9	1.66	2.46	.595m	1.15m	4.73m	12.40m	190.00	295.00	1.66z	3.93z
St. Louis	136.9	1.64	2.55	.50	1.08	4.45	10.80	180.00l	380.00l	1.45hl	3.10hl
San Francisco	148.6	1.73	2.46	.78d	1.69d	6.72d	16.36d	320.00l	560.00l	1.05m	3.30m
Seattle	149.0	1.73	2.46	.57b	1.33b	6.84	.....	220.00c	.....	1.10hy	3.25hy
Toronto	.....	.....	.....	.76	1.425	6.00	.....	187.00	280.00	1.02	3.57

*WROUGHT STEEL PIPE (Full standard weight) Discount from list; see footnote

Mill	2½ & 3 in. Butt Weld + Galv. %	3½ to 6 in. Lap Weld + Galv. %	3½ to 4 in. Black %	5 & 6 in. Black %	7 to 12 in. Black %
Lorain, Ohio	16.75	0.50	+8.00a	.....	.....
Aliquippa, Pa	16.75	3.00	.....	6.25a	.....
Sparrows Pt., Md.	14.75	1.50	.....	.....	.....
Benwood, W. Va.	16.75	0.50	+10.50a	6.25	+10.50a
Youngstown, O.	16.75	0.50	+11.50a	5.25ab	+11.50a
Indiana Harbor, Ind.	15.75	0.50	.....	.....	.....
Sharon, Pa.	16.75	0.50	.....	6.25a	+10.50a
Wheatland, Pa.	16.75	0.50	.....	4.50d	+9.75d
Etna, Pa.	16.75	3.00	.....	3.00	+7.25ab
Fontana, Calif.	3.25	+13.00	.....	.....	+24.00ab

a 3½ to 4 in. b Continuous
† Production discontinued
†Threaded and coupled. ‡Extra quality §Asbestos cement pipe, 6 in. weld, 8 and 6 in. d 6 in.

*†Extra quality *‡ delivered. *a PRICE INDEXES for CENTRIFUGAL CAST IRON PIPE (Include carload freight allowed to city). These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S, PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala., 125.8; Burlington, N. J., 134.6. *b Extra strength. *c 4-in., $130. *d SS361-A *f 21 in. *g culvert pipe; reinf., ASTM C 75-56 *h reinf., ASTM C 75-54 *i reinf., ASTM C 76-55 *j centrispun; no standard specs. in Canada. *k 2% cash *l fob plant *m truck del. *n LCL del., fob truck *o listed price based on LCL (no min.) *p freight allowed to destination in city *q ASTM C 13-40 *r CL fob origin, freight allowed *s 1 ft lengths *t 3 ft lengths *u CESA A 60-1941 *v standard strength *w SS; add 20% for d.s. *x fob city *y Reinforced 12 in. $1.95, 24 in. $4.75

* WROUGHT STEEL PIPE: Deduct discounts shown above from the following standard list consumers carload prices to get mill price. List prices per ft.(*based on approx. $200 per net ton): Butt Weld ⅛ in., 8½¢; ¼ in., 6¢; ⅜ in., 6¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 78½¢. Lap Weld 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Add freight, 3% transport tax for destination price. † Production discontinued November 1957

WROUGHT IRON PIPE: List prices per ft. same as for wrought steelpipe, but add following "discounts" to get Pittsburgh mill price: Butt Weld—1 in. black, + 65.54, galv., + 95.77; 1¼ in. black, + 65.54, galv. + 95.23, 1½ in. black, + 61.79 galv. + 91.22; Lap Weld —2½ in. to 3 in. black + 67.95 galv. + 95.77; 4½ in. to 6 in. black + 64.74 galv. + 90.68 Add freight rates plus 3% transportation tax to get destination price.

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

▲ **Mass., Arlington**—SCHOOL—BA 1/30—Town, supt. Schools, 23 Maple St., Senior High School addn. $1,200,000. Korslund, LeNormand & Quann, Inc., 506 Washington St., Norwood, archt.

Mass., Framingham—WARDS, CLINIC, etc.—BA 1/31—State, Dpt. Mental Health, c/o Div. Bldg. Constr., 38 Chauncy St., Boston, M-279, Contract 4, renovation wards, clinic and residence bldg. at Cushing Hospital. $540,000. Plans deposit $40. Curtin & Riles, 45 Newbury St., Boston, archts. CD 1/5/56.

HEAVY CONSTRUCTION—LB & CA

▲† **U. S. Eng.**, 150 Causeway St., Boston 14, Mass., cancelled bids to have been opened Jan. 7, Hodges Village Dam and appurtenant structures, French River, Oxford, CIVENG-19-016-58-30, MASSACHUSETTS. $1,000,000. Will re-advertise. CD 12/4.

BUILDINGS—LB & CA

L. D. Phillips Constr. Co., Inc., 8 Main St., Westfield, Mass., CA **$591,871**. Hugh Scott Streiber Memorial ELEMENTARY SCHOOL, off Telegraph Ave., CHICOPEE, MASS. City, John L. Fitzpatrick, supt., 135 Grape St., Chicopee, Mass. Bids Dec. 20. CD 1/3, under LB.

L. & R. Constr. Co., 84 Main St., North Reading, Mass., CA **$588,008**, Daniels ELEMENTARY SCHOOL addn., Daniels St., MALDEN, MASS. City, School Comm., c/o Mayor F. L. Lamson, Mayor's Office, City Hall, Malden, Mass. Bids Dec. 19. CD 12/26, under LB.

▲ **R. C. Diocese of Springfield**, Chancery Office, Elliott St., Springfield, Mass., cancelled bids to have been opened Jan. 16, Cathedral High School between Wendover Rd. and Roosevelt Ave., SPRINGFIELD, MASS. Eggers & Higgins, 100 E. 42nd St., New York 17, N. Y., archts. Will re-advertise. CD 12/9.

Fabrizio & Martin, Inc., McLaren Rd., Darien, Conn., CA **$997,374**. Proj. B1-D-2006, FINE ARTS CENTER, University of Conn., STORRS, CONN. State P. Wks. Comr., 165 Capitol Ave., Hartford, Conn. Bids Nov. 27, awarded Dec. 30. CD 12/4, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **New York**—BA 1/20—President Richmond Boro, Borough Hall, St. George 1, N. Y., Constr. Contr. 2A, east service road, grading, and drainage of West Shore Expressway in Staten Island. Plans deposit $20. CD 3/18.

BUILDINGS—BA

▲ **Pa., Chester**—HOSPITAL—BA 1/30—Henry D. Daget & Sons, archts., 1329 Race St., Phila. (selected list of bidders) hospital for Sacred Heart Hospital, 9th and Wilson Sts. $3,400,000. Robert J. Sigel, Nerberth, engrs. CD 5/28.

HEAVY CONSTRUCTION—LB & CA

▲ **Vincent J. Smith, Inc. and Howard & Sprague, Inc.**, 656 State St., Binghamton, N. Y. CA **$3,746,210**. water filtration plant, BINGHAMTON, N. Y. Bd. Contract and Supply Council Chambers, City Hall, Binghamton, N. Y. Bids Oct. 30. CD 11/7, under LB.

▲ **Lasker-Goldman Corp.**, 50 E. 42nd St., New York, N. Y., CA **$7,240,000**, general contract Southwest Brooklyn Incinerator, BROOKLYN, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Bids Sept. 19. CD 9/19.
Heimler Electric Service, 1052 2nd Ave., New York, N. Y., CA **$395,000**, electrical contract, Southwest Brooklyn Incinerator (Brooklyn, N. Y.).

▲ **Caye Constr. Co., Inc.**, 356 Fulton St., Brooklyn, N. Y. CA **$12,930,550**. Grand Stant at Aqueduct track, OZONE PARK, N. Y. Great New York Assn., c/o Aqueduct Race Track, Ozone Park, N. Y. Arthur Froelich Assocs., 383 S. Robertson Blvd., Beverly Hills, Calif., archts.

Peter A. Camilli & Sons, Inc., 75 Cooley St., Pleasantville, N. Y., LB **$960,000**. steam tunnel at Grasslands in Town of Mount Pleasant, VALHALLA, N. Y. Dpt. P. Wks., Westchester Co., County Office Bldg., White Plains, N. Y. Bids Dec. 18. CD 12/11.

BUILDINGS—LB & CA

Otis Elevator Co., 260 11 Ave., New York, N. Y. CA Est. **$700,000**. 8 story, 230-car capacity AUTOMATIC PARKING GARAGE, 42nd St., 200 ft. west of Eighth Ave., NEW YORK, N. Y. Columbia University and Speed-Park Corp., 342 Madison Ave., New York, N. Y.

▲ **Valentine Manor**, c/o H. Herbert Lilien, archt., 201 W. 72 St., New York 23, N. Y., Owner Builds, **$1,000,000**. 136 family APARTMENT HOUSE, 480 Riverdale Ave., YONKERS, N. Y.

▲ **Mermaid Estates**, 901 Township Line Rd., Norristown, Pa., Separate Contracts. **$1,280,000**. 64 RESIDENTIAL DEVELOPMENT, Arch St. Rd., etc., NORRISTOWN, PA.

Frank H. Wilson & Co., Ardmore, Pa., LB **$619,800**. general contract ELEMENTARY SCHOOL, Fox Chase and Castor Aves., PHILA., PA. Bd. Educ., 21 and Winter Sts., Phila., Pa. Stickle & Assocs., 134 Narberth Ave., Narberth, Pa., archts. CD 11/26/56.

Henry O. MacCulloch, 104 Keswick Ave., Glenside, Pa., Separate Contracts. **$750,000**, 52-unit RESIDENTIAL DEVELOPMENT, Store Rd., etc., SKIPPACK, PA.

▲ **F. D. Rich Co.**, 550 Summer St., Stamford, Conn. CA **$4,817,000**. 400 unit Riverside HOUSING DEVELOPMENT, WILMINGTON, DEL. Wilmington Housing Auth., 1400 Todds Lane, Wilmington, Del. Bids Dec. 17. CD 12/19, under LB.

SOUTH

HEAVY CONSTRUCTION—LB & CA

NORTH CAROLINA—State Hy. Comm., Raleigh,
Wm. Muirhead Constr. Co., Box 2012, Durham, N. C., CA **$537,712**, (3 bidders) Contr. No. 1-725 (2), Proj. 8.14572, structure 3.81 mi. US 70, relocations, Orange and Durham Counties, North Carolina. Bids Dec. 3, awarded Dec. 30. CD 12/9, under LB.

NORTH CAROLINA—State Hy. Comm., Raleigh,
Barrus Constr. Co., Box 395, Kinston, N. C., CA **$661,017**, (3 bidders) Contr. No. SF-13 (6), grading 8.12854 roadway, Wayne and Duplin Counties. Bids Dec. 3, CD 12/9, under LB.

† **T. A. Loving & Co.**, Bank of Wayne Bldg., Goldsboro, N. C., LB **$760,713** (Base bid) Army Aviation facilities, Simmons Field, ENG 31-075-58-4, FORT BRAGG, N. C. U. S. Eng., 308 Customhouse, Wilmington, N. C. Bids Dec. 19, CD 11/14;
J. H. Sloan Constr. Co., S. Kerr Ave., Wilmington, N. C., LB **$814,814** Alternate Bid, Army Aviation Facilities, Simmons Field, (Fort Bragg, N. C.)

▲ **Barger Constr. Co.**, 484 N. Main St., Mooresville, N. C., CA **$1,966,750** general contract War Memorial Coliseum, GREENSBORO, N. C. City, City Hall, Greensboro N. C. Bids Dec. 11. Grand total $2,904,067. CD 12/31, under LB.
W. H. Sullivan Co., Inc., 4413 West Market Ext., Greensboro, N. C., CA **$390,000**, heating, ventilating and air conditioning, CA **$168,000**, ice rink and refrigeration War Memorial Coliseum, (Greensboro, N. C.);
Robb Plumbing & Heating Co., 117 W. Lexington Ave., High Point, N. C., CA **$99,100**, plumbing and heating, War Memorial Coliseum, (Greensboro, N. C.);
Starr Electric Co., 1421 Battle Ground Ave., Greensboro, N. C., CA **$250,217**, electrical contract, War Memorial Coliseum (Greensboro, N. C.)

Boyce Co., 504 Pennsylvania Ave., Clearwater, Fla., CA **$624,000**, Item "B", Phase 11B, water pump station and force main, St. Lucie River, Martin Co., ST. LUCIE RIVER, FLA. Air Products, Inc., 949 Hamilton St., Allentown, Pa. Rader & Assocs., 111 NE 2nd Ave., Miami, Fla., engrs. Awarded 12/24. CD 12/17, under LB.

▲ **C. F. W. Constr. Co.**, Fayettesville, Tenn., LB **$1,070,261**, Contr. "A", interceptor sewers and force mains, DECATUR, ALA. City, City Hall, Decatur, Ala. Bids Dec. 12. CD 11/18;
Dethiefs & Hannon, 218 W. 11th St., Anniston, Ala., LB **$869,115**, Contr. "B", sewage treatment plant and sewerage pumping station (Decatur, Ala.)

KENTUCKY—State Dpt. Hys., Frankfort,
Foster & Creighton Co., American Natl. Bank Bldg., Nashville, Tenn., CA **$678,252**, b. conc. surf. Class I (river grav. aggreg.) with crushed limestone for insulation, entrances, maint. of traffic and detours 0.621 mi. The Newport-Claryville Rd., US 546 (3), USG 546 (2); SP 19-131, Campbell Co. Bids Oct. 18, awarded Dec. 30. CD 10/29, under LB.

Frank Messer & Son, Inc., 4612 Paddock Rd., Cincinnati 29, O., CA **$910,600**, administration bldg. at Greater Cincinnati Airport, COVINGTON, KY. Kenton County Airport Bd., Third and Court Sts., Covington, Ky. Bids Dec. 10. CD 12/16, under LB.

BUILDINGS—LB & CA

† **King-Hunter, Inc.**, 1412 Westover Terrace, Greensboro, N. C. CA **$640,846**, PARACHUTE PACKING and MAINTENANCE BLDG., ENG. 31-075-58-2, FORT BRAGG, N. C. U. S. Eng., 308 Customhouse, Wilmington, N. C. Bids Dec. 13, CD 11/14.

Spector & Sons, 575 SW 22nd Ave., Miami, Fla., CA WAREHOUSE AND OFFICE BLDG., HIALEAH, FLA. Seaboard Warehouse Terminals, Inc., 3651 N. W. 51st St., Miami, Fla. CD 11/27.

David M. Woolin & Son, Inc., 18320 S. Dixie Hy., Perrine, Fla., CA **$950,000**, 112 RESIDENCES, 1 story, 34 x 36 ft. CB SW 188 Terrace Seabreeze Dr., NEW SOUTH MIAMI HEIGHTS, FLA. Crystal Development Corp.; c/o contractor.

Mabry Constr. Co., 202 N. Oregon, Tampa, Fla., CA **$545,287**, Venice JUNIOR HIGH SCHOOL, VENICE, FLA. Bd. Pub. Instruction, Supt. Office, Courthouse, 225 Palm Ave., Sarasota, Fla. Bids Dec. 12, CD 12/20, under LB.

† **Blount Bros. Constr. Co.**, Box 1114, Montgomery, Ala., CA **$881,201**, air-conditioned TECHNICAL LIBRARY and 3 SHOP BLDGS. at Redstone Arsenal, HUNTSVILLE, ALA. U.S. Eng., 2301 Grant St., Mobile, Ala. Bids Dec. 19. CD 12/31, under LB.

▲ **A C. Sanford, Inc., Contractors**, Box 1229, Albany, Ga., LB **$2,105,906**, HOUSING, involving 240 low-rental units, GULFPORT, MISS. Mississippi Regional Housing Auth., No. VIII, John Lee Gainey, exec. dir., City Hall, Gulfport, Miss. Bids Dec. 19. CD 11/25;
Southern Builders, Inc., 3355 Poplar Ave., Memphis, Tenn., LB **$91,170**, water wells for low-rental housing (Gulfport, Miss.)

Dye & Mullings, Inc., Contractors, Inc., Box 112, Columbia, Miss., CA **$930,037**, SENIOR HIGH SCHOOL, HATTIESBURG, MISS. Hattiesburg Municipal Special School Dist., Hattiesburg, Miss. Associated School Architects, 418 Ross Bldg., Hattiesburg, Miss., archts. Bids Dec. 13. CD 3/23/53.

Flint Bros. Constr. Co., Box 1289, Jackson, Miss., LB **$800,000**, general contract two DORMITORIES, at Mississippi Southern College, HATTIESBURG, MISS. State Bldg. Comm., E. J. Yelverton, secy., Jackson, Miss. Landry & Matthes, 214 W. Pine St., Hattiesburg, Miss., archts. Bids Dec 20. CD 12/7/56.

Boone Constr. Co. of Nashville, Lone Oak Rd., Nashville, Tenn., CA **$700,000**. HOSPITAL WARD for emotionally disturbed children, NASHVILLE, TENN. Vanderbilt University, Nashville 5, Tenn. Awarded Dec. 30. CD 2/12.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

Ill., Chicago—BA 1/30—City, City Hall, grading, paving NW Route Superhighway from W. Madison to W. Fulton. $700,000.

BUILDINGS—BA

▲ **Ind., Schererville**—SEMINARY—BA 1/21—Capuchin Order of Franciscan Missionaries, 1740 Mount Elliott

(Continued on page 88)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England | Middle West
Middle Atlantic | West of Mississippi
South | **Far West**

PROPOSED WORK

Water Supply | **Public Buildings**
Sewers, Waste Disposal | Mass Housing
Bridges | **Commercial Buildings**
Streets & Roads | **Industrial Buildings**
Earthwork, Waterways | **Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

Denver's Coliseum...

Illustrates Versatility of Concrete for Arena Buildings

Denver's Coliseum is a handsome example of the functional use of concrete for arenas requiring uninterrupted enclosed space with minimum maintenance. Its arched construction requires no supporting pillars and provides a clear and unobstructed view of the entire arena area. Only concrete, the completely plastic building material, can be so molded and formed into any shape with all of its strengthening reinforcement inside.

Throughout the long years of its life, this concrete building will be virtually maintenance-free—a joy both to taxpayers and to spectators who attend the public functions held therein.

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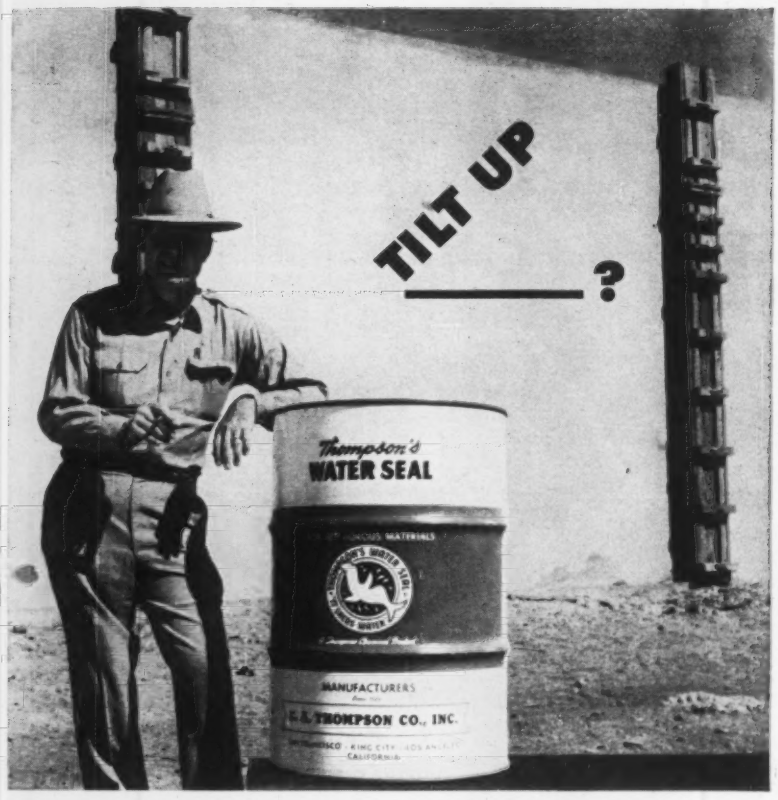

here's the West's Answer to your Concrete Questions!

* **What parting compound delivers smooth concrete without leaving stains or residue that interfere with painting?**
"Thompson's Water Seal eliminated the problem of stains in our tilt-up concrete walls. Now panels are easily removed from the surface slab and painting proceeds speedily."
ASSOCIATED CONSTRUCTION AND ENGINEERING COMPANY OF CALIFORNIA, San Francisco, Calif.

* **Is there one curing, separating and form-sealing method that easily produces hard, dust-free surfaces?**
"Of all the chemicals we tested in our tilt-up work, Thompson's Water Seal proved the cheapest insurance against costly grief and painting troubles."
BAYCITIES CONSTRUCTION CO., Oakland, Calif.

* **Is it possible to prevent all moisture damage in concrete under pressure or capillary action, regardless of weather?**
"As waterproofing specialists in heavy construction work, we use Thompson's Water Seal on all concrete moisture problems with constant success and at a great saving."
STANLEY H. KOLLER CONSTRUCTION, Crockett, Calif.

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(Continued from page 86)

Ave., Detroit, Mich., 2 story, bsmnt., brick seminary, $2,000,000. Charles D. Hannan, 32580 Grand River, Farmington, Mich., archt. CD 11/27.

▲ **O. Toledo**—STUDENT UNION—BA 1/21—University of Toledo, 2806 W. Bancroft, Student Union Bldg., University of Toledo, $1,000,000. Bellman, Gillett & Richards, 1600 Madison, archts. Plans deposit $25, gen., mech, and electrical; mech. $10, kitchen equip. $10; elec. $10. CD 7/24/57.

BUILDINGS—SLC

▲ **Ill., Chicago**—TOWNHOUSES—Howard-Western Properties, Inc., 228 N. La Salle St., soon lets contract 150 townhouses, vicinity Howard and Western, $3,000,000. A. J. DelBianco, 5501 W. Irving Park Rd., archt.

HEAVY CONSTRUCTION—LB & CA

MICHIGAN—State Hy. Dpt., John C. Mackie, comr., Stevens T. Mason Bldg., Lansing,

Darin & Armstrong, Inc., 2041 Fenkell St., Detroit, Mich., CA **$617,000**, est. $680,000, four bridges on relocation US-23 over Raisin River, Dixon Rd., M-50 and Brewer Rd., Dundee, F B2 of 58-5-9 C2-RN F B3 of 58-4 9 C1-RN F B5 of 58-4-9 C1-RN F B4 of 58-4-9 C1 UN (F 218 13), Monroe Co. Bids Dec. 11. CD 12/19, under LB.

▲ **MICHIGAN**—State Hy. Dpt., John C. Mackie, comr., Stevens T. Mason Bldg., Lansing,

Mich.—Denton Constr. Co., 20415 Mack, Grosse Pointe, Mich., CA **$3,111,680** est. $3,130,000, dual 24 ft. concrete 9.003 mi. US-23 relocation from Morocco Rd. North to M-50, F 58034 C1-RN (F 58034 C2-UN (F 218-14) Monroe Co.; CA **$1,028,623**, est. $1,090,000, dual 24 ft. concrete paving, concrete base course wid'n. b. conc. surf., 2 bridges 2.577 mi. relocation US-12 from Harris Rd., Ward Rd., IN 81041 C2-R (IN 02-5 6), FAI, Washtenaw Co.;

Mich.—Hertel-Deyo Co., 5205 Division St. South, Grand Rapids, Mich., CA **$2,244,998**, est. $2,420,000, dual concrete pavement, 5 bridges 5.831 mi. from M-20 east of 8-Mile Rd., Williams-Monitor, BM 09101 C3-R BM B1 of 9-14-12 C1-R, Bay Co.;

Mich.—Charles J. Rogers Constr. Co. & Cooke Contg. Co., 1116 Penobscot Bldg., Detroit, Mich., CA **$1,325,569**, est. $1,470,000, 36 ft. dual concrete 0.865 mi., drainage structures, ramps, utilities, Detroit, BI 82025 C8-UN (I-09-1 48), Wayne Co.;

Mich.—C. E. Utterback, Rte. 2, Mt. Pleasant, Mich., CA **$594,012** est. $600,000, 25 ft. aggreg. base course, prime and double seal 7.573 mi. M-55 from M-65 east, F 35022 C1-R (F 134 2), Iosco Co.;

Mich.—Bairley & Lindley, Inc., 4000 West Jefferson St., Trenton, Mich., CA **$867,033**, est. $930,000, 36 ft. concrete 2.207 mi. US-24 from US-1 to Oxford St. and bridge over Ecorse Creek north of Van Buren Rd., Dearborn, F 82052 C1-R F 82052 C2-U (F 42 6), F 82052 C8 U F B 4 of 82-3-1 C3-R (F 42 7), Wayne Co.;

Mich.—L. A. Davidson Co., 213 E. St. Joseph St., Lansing, Mich., CA **$1,856,685**, est. $2,030,000 dual 24 ft. concrete paving 4 bridges 2.704 mi. on relocation US-16 from Portland Rd. to Grand River Bridge, Orange-Portland, BI 34044 C3-RN BI B1 of 34-11-6 C1-RN, etc., Ionia Co.;

Mich.—Carl Goodwin & Sons, Allegan, Mich., CA **$959,859**, est. $1,040,000, 24 ft. concrete paving and bridge over Pigeon River 8.914 mi. US-31 from M-21 west to West Olive, F 70013 C1-RN F B1 of 70-17-3 C2-RN (F 155 27), Ottawa Co.;

Mich.—A. Lindberg & Sons and Bacco Constr. Co., Ishpeming, Mich., CA **$775,635**, est. $830,000, aggreg. base course and bridge 6.654 mi. M-33 and M-68 from Westerly June, also aggreg. base course with prime and double seal 2.467 mi. from Legrand south, F 16023 C1-R (F 72-3-SS 16051 C1-R (S 113 3), Cheboygan Co.;

Mich.—L. W. Edison Co., 924 Floral Dr. S. E., Grand Rapids, Mich., CA **$3,048,312** est. $2,920,000 dual 24 ft. paving, 3 bridges 8.572 mi. on relocation US-16 Nash Hy. to M-66, Dundee, BI 34043 C2-RN BI B2 of 34-1-6 C1-R1 BI B2 of 34-2-6 C1 RN BI B3 of 34-26 C1-RN (I 04-2 7), FAI, Ionia Co. Grand total $15,812,406, Bids Dec. 11, CD 11/21.

BUILDINGS—LB & CA

▲ **Knowlton Constr. Co.**, 1133 Columbus Ave., Bellefontaine, O., CA **$1,230,500**, general contract GARFIELD HIGH SCHOOL, HAMILTON, O. Hamilton Bd. Educ., 322 Dayton St. Hamilton, O. Bids Dec. 12, awarded Dec. 17. CD 12/17, under LB.

▲ **Knowlton Constr. Co.**, 1133 Columbus Ave., Bellefontaine, O., CA **$1,236,700**, general contract TAFT HIGH SCHOOL, HAMILTON, O. Hamilton Bd. Educ., 322 Dayton St., Hamilton, O. Bids Dec. 12, awarded Dec. 17. CD 12/17, under LB.

▲ **Fred Berglund & Sons, Inc.**, 8410 S. Chicago Ave., Chicago, Ill., CA **$2,500,000**, HIGH SCHOOL, SOCIAL CENTER and CONVENT, CHICAGO, ILL. St. Francis de Sales High School E 102nd and S. Ewing Ave., Chicago, Ill. Belli & Belli, 10159 S. Ewing Ave., Chicago, Ill., archt.

Chas D. Smith & Son, Inc., P. O. Box 508, Fond du Lac, Wis., CA Est. **$687,830**, general contract HOSPITAL addns., alterations, FORT ATKINSON, WIS., Fort Atkinson Memorial Hospital, Fort Atkinson, Wis., Bids Dec. 20, Schmidt, Garden & Erickson, 104 S. Michigan Ave., Chicago, Ill., archts. CD 11/27.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

Okla., Muskogee—BA 1/27—City, City Hall, Contr. 2, sewage disposal plant. $500,000. Plans deposit $50. Benham Eng. Co., 215 N.E. 23rd St., Oklahoma City, engr. CD 7/16.

(Continued on page 90)

An important message to every man who designs or constructs Highway Bridges

WITH NATIONAL, state and local roadbuilding efforts beginning to dovetail, the vast highway program is on its way. How fast it moves and how much it costs depends in a large measure on the type of bridges you build.

And the facts show that, structurally or economically, steel remains clearly the best construction material you can use. For only steel combines both strength and toughness and readily lends itself to fabrication, alteration and inspection to save you time, space and dollars.

So whether you design bridges or constuct them, we believe the following construction fundamentals show that steel will serve you best.

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2. STRENGTH—Steel has far, far greater unit strength than any other construction material. It permits long, clear spans . . . it's dependable.

3. TOUGHNESS—Steel is tough and ductile. It has a great capacity to take abnormal loads or impacts; and when pushed beyond capacity, steel will yield without breaking—adding a safety factor where safety is vital.

4. WORKABILITY—Steel can be sheared, drilled, punched, flame-cut, machined, welded and formed . . . it lends itself to practically every known method of fabrication. This permits extensive preassembly of material at the plant—reducing assembly forces at the site. Design possibilities are practically unlimited. And only steel gives you the advantages of bolted, riveted or welded connections.

5. ALTERABILITY—Steel lends itself so readily to change that structures can be altered during or after construction with minimum time, trouble and cost.

6. SHIPPING, HANDLING AND STORAGE—Steel's great strength and toughness means it can take rough handling. There's less weight and bulk to ship. It can be stored compactly, saving valuable space. It can be erected throughout the year and it goes up fast, saving valuable time.

7. INSPECTION—The condition of steel is obvious during manufacture, during fabrication, during erection, and years after installation. A steel structure is always easy to check visually; the possibility of human error has been all but eliminated.

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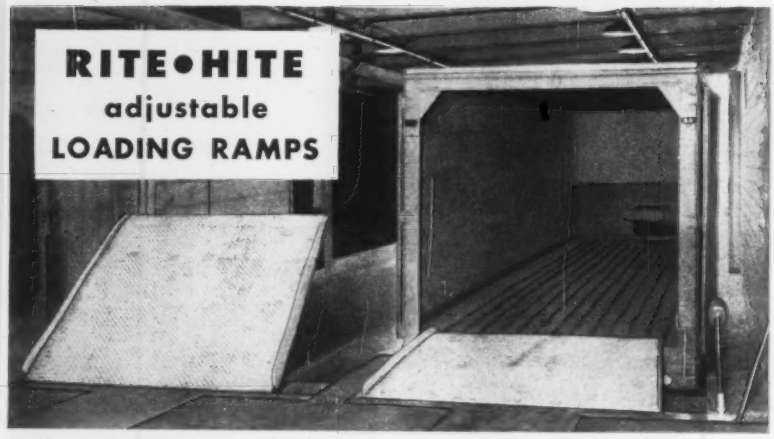

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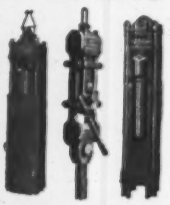

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(Continued from page 88)

BUILDINGS—BA

Mo., Springfield — FINE ARTS — BA 1/30 — Southwest State College, Bd. Regents, Springfield, Fine Arts Bldg. $875,000. A. C. Esterly, 400 McDaniel Bldg., archt. CD 9/4, under LB.

Tex., Houston — HOTEL, MOTEL — Bids Asked — Morin Scott, 103½ E. 7 St., Austin, 154 room and apartment unit hotel-motel $750,000-$1,750,000. Winfred O. Gustafson, 1312A S. Congress St., Austin, archt. Walter P. Moore, 2 Pinedale St., engr. CD 10/10.

BUILDINGS—SLC

Ark., Texarkana — HOSPITAL — Cotton Belt Hospital, P. C. Haltzcaw, Texarkana, soon lets contract hospital imprvs., incl. air-conditioning. $500,000. Page, Southerland & Page, 602 West Ave., Austin, Tex., archts.-engrs. CD 10/22/56, under St. Louis Southwestern R.R. Lines Hospital Trust, as owner.

▲ Mo., St. Louis—OFFICE—The Caradine Hat Co., Raymond H. Wittcoff, vice pres. and dir., 8 S. 4th St., Zone 2, soon lets contract 8 or 10 story, bsmnt., brick, steel, concrete, glass, etc., office bldg. Over $2,500,000. Jamieson, Spearl, Hammond & Grolock, 1696 Arcade Bldg., 812 Olive St., Zone 1, archts. William C. E. Becker, 417 N. 7th St., Zone 1, structural engr., and John D. Falvey, 316 N. 8th St., Zone 1, mechanical engr. CD 6/12.

▲ Tex., Galena Park—PLANT—U. S. Gypsum Co., 300 W. Adams St., Chicago, Ill. (Hdqrs.) and Galena Park, Tex., soon lets contract plant on 30 acre tract on Ship Channel. $5,000,000. CD 11/27.

HEAVY CONSTRUCTION—LB & CA

▲† U. S. Eng., 1709 Jackson St., Omaha, Neb., cancelled bids to have been opened Dec. 18, power structure, intake shafts and upstream tunnels Oahe Reservoir Proj., Inv. 25-066-58-53, SOUTH DAKOTA. CD 11/14.

NEBRASKA—State Dpt. Rds. & Irrigation, Lincoln. Bids opened 12/19,

Parsons Constr. Co., 2512 Deer Park Blvd., Omaha, Neb. LB $660,551, bridges Lincoln-Omaha Rd. near Millard, Proj. IN-01-09 (21), Douglas Co. CD 12/11.

▲ NEBRASKA—State Dpt. Rds. & Irrigation, Lincoln, Neb.—Missouri Valley Constr. Co., Grand Island, Neb. CA $365,074, grading, detour armor coat bit. sand S. C., Greeley-Bartlett, Proj. F-460 (3) Greeley Co., CA $129,234, grading, gravel, gravel-detour guard rail armor coat granular fill and bit. sand S. C., Cairo North, Proj. S-357 (8) Hall and Howard Counties; CA $451,861, grading, detour, soil-aggreg. B. C., b. conc. S. C. 11.8 mi. McCook-Maywood, Proj. F-245 (10) Frontier Co.; CA $335,868, grading, detour pavement, guard rail, granular subbase and soil-agg. B. C., 0.1 mi. bit. sand B. C. ab. conc. S. C. 8.5 mi. St. Paul-Clarks Proj. F 324 (5) Howard and Merrick Counties;

Neb.—George K. Werner & Son, Clay Center, Neb. CA $313,420, grading, detour, soil-aggreg. B. C. armor coat bit. sand S. C. b. conc. S. C. 9.3 mi. Arnold-Merna, Proj. F-138 (4) Custer Co.; CA $86,586, detour subgrade reconstr. shoulder constr. and soil-aggreg. B. C., b. conc. S. C. 3.5 mi. Arnold-Merna, Custer Co.;

Neb.—Theisen Bros., Osmond, Neb. CA $204,754, grading, detour pavement 11.6 and 0.5 mi.;

Neb.—Blacktop Inc., Fremont, Neb. CA $174,077, grading, gravel-detour culverts, subgrade, reconstr. and granular fill armor coat bit. sand B. C. Bit. Mat. 5.1 mi. Niobrara East, Proj. S 714 (2), Knox Co.;

Neb.—Booth & Olson, Inc., 529 Ins. Exchange Bldg., Sioux City, Ia. CA $429,551, grading, pavement 5.4 mi. Union-Omaha Rd. near Plattsmouth, Cass Co.;

Neb.—Robert M. Stump Constr. Co., Memphis, Neb. CA $149,675, grading, detour, granular subbase course and soil-aggreg. B. C. b. conc. S. C. 3.6 mi. Hazard-Pleasanton, Proj. F-73 (6) Sherman, Buffalo Counties. Grand total $2,640,100. Bids opened Dec. 19, awarded Dec. 27 and 30. CD 12/11.

▲ KANSAS—State Hy. Comn., Ottawa,

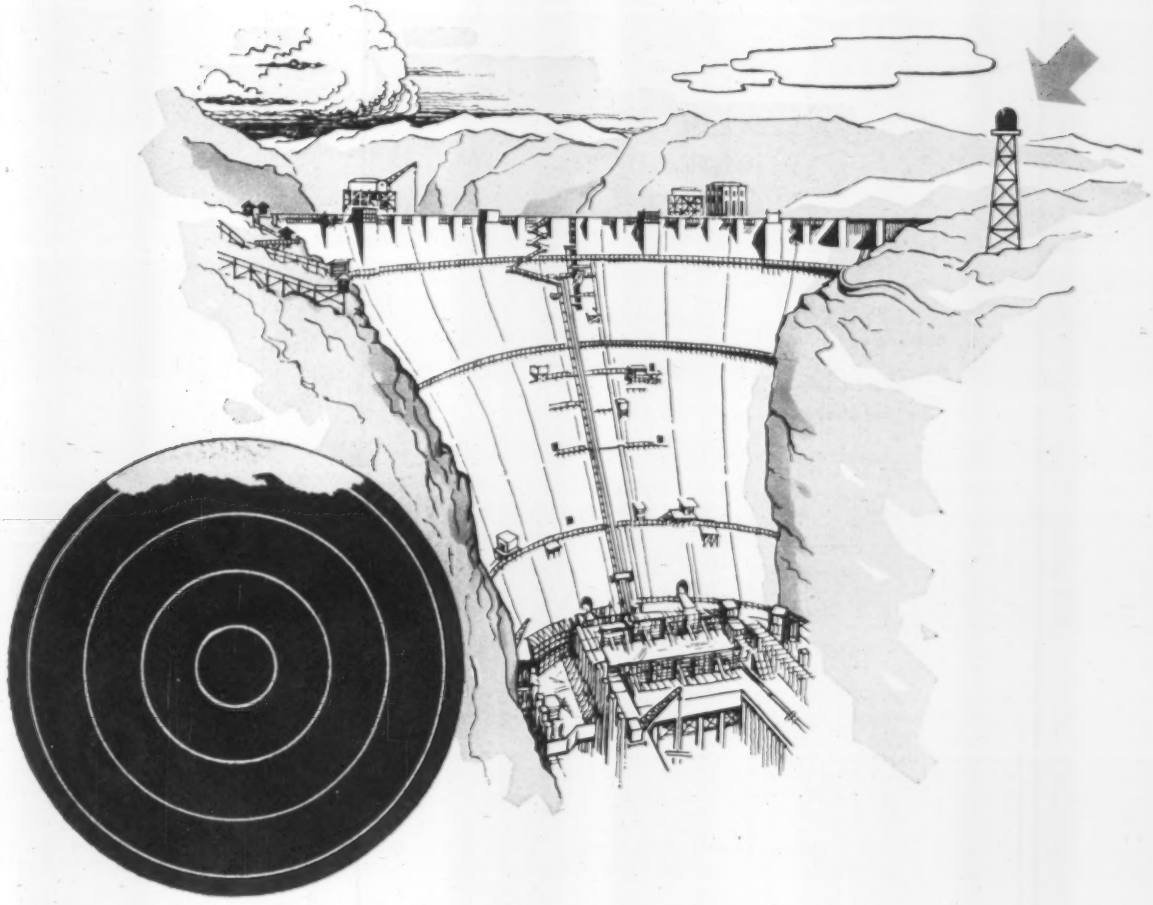
Koss Constr. Co., Pauline, Kan. CA $973,661. (6 bidders), c. conc. 3.325 mi. beginning 200 ft. northeast of existing US-50 approx. 1½ mi. south of Ottawa, thence northeasterly on new location US-50 (Interstate), SP No. 50-30-I 02-3 (15) Pt. I; CA $1,098,444, (7 bidders), c. conc. 5.686 mi. beginning at north end Marais des Cygnes River Bridge approx. 1 mi. east of Ottawa, thence north and northeasterly on new location US-50 (Interstate), SU No. 50-30 I 02-3 (15) Pt. II; CA $1,445,859, (6 bidders), c. conc. 7.376 mi. beginning approx. 1 mi. east Wellsville on Franklin-Miami County line, thence southwesterly on new location US-50 (Interstate), SP No. 50-30 I 02-3 (15), Pt. III, all foregoing in Franklin Co. Bids Dec. 19, Grand total $3,517,964. CD 12/27, under LB.

Bur-Tex Contractors, Inc., Box 336, Corpus Christi, Tex. CA $658,200, Base Bid, $769,380, Alternate Bid, sewage treatment plant, CORPUS CHRISTI, TEX. City, City Hall, Corpus Christi, Tex. Bids Dec. 11. CD 12/18, under LB.

BUILDINGS—LB & CA

▲ H. B. Deal & Co., Inc., 5517 Manchester Ave., St. Louis 10, Mo. CA $1,000,000. 3 story, bsmnt., 100x150 ft. architectural concrete, rein.-con. BUS TERMINAL to car rental service facilities, office, stores, etc., razing 5 story bldg. on site at 900-908 Washington Ave., ST. LOUIS, MO. Corporation forming, c/o Glick Real Estate Co., 107 N. 8th St., St. Louis 1, Mo. Greyhound Corp., Rent-a-Car-Div., 141 W. Jackson Blvd., Chicago, Ill., lessee. Sommerich &

(Continued on page 92)



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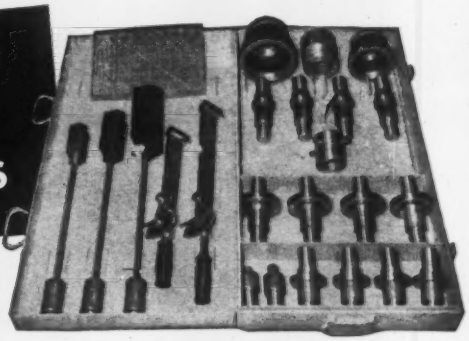

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Assemble the Vane to the Rod!

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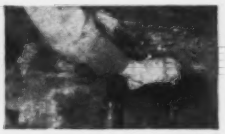
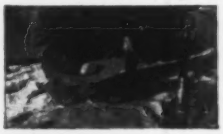


Consult the Torque Chart for Accurate Reading!



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(Continued from page 90)

Wood, 8135 Forsyth Blvd., Clayton 24, Mo., archts. Neal J. Campbell, 911 Locust St., St. Louis 1, Mo., engr. CD 11/19, under Southwestern Greyhound Lines, Ft. Worth, Tex., as owner.

▲ **MacDonald Constr. Co.**, 1310 S. Grand Blvd., St. Louis 4, Mo. CA Est. Approx. $5,000,000. 1957 modernization program, incl. addns., alterations to 3 story ASSEMBLY BLDGS., together with alterations to PART & SERVICE BLDG., MILL BLDG., OFFICES, Parking Lots, etc. at Chevrolet St. Louis Assembly Plant, 5301 Natural Bridge Ave., ST. LOUIS, MO. Chevrolet St. Louis Div. of General Motors, General Motors Bldg., Detroit, Mich. Smith-Hinchman & Grylls Assocs., Inc., 800 Marquette Bldg., Detroit, Mich., engr.-archt.

▲ **General Electric Co., Apparatus Sales Div.**, 1 River Rd., Schenectady, N. Y. LB $4,473,800, est $6,818,000. (3 bidders), Contr. 260, furnish, erect one 125,000 kil. STEAM TURBINE GENERATOR UNIT and accessory equipment at North Omaha Power Station, OMAHA, NEB. Omaha P. Power Dist. 17 and Hearny Sts., Omaha, Neb. Bids Dec. 19. CD 11/27.

† **Robert E. McKee, Gen. Contr. Inc.**, Box 562, El Paso, Tex. CA $610,440. (AEC) simulation LABORATORY, White Sands Proving Grounds, Inv. No. ENG-29-005-58-38, LAS CRUCES, N. M. U. S. Eng., Box 1538, Albuquerque, N. M. Bids Dec. 20. CD 1/2, under L. B.

† **U. S. Eng.**, P.O. Box 1538, Albuquerque, N. M., cancelled bids to have been opened Jan. 16, ABMA VERTICAL LAUNCHING FACILITY, White Sands Proving Grounds, Inv. No. 29-005-58-52, LAS CRUCES, N. M. $500,000-$1,000,000. CD 1/6.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **Calif., San Bernardino**—BA 1/27—East San Bernardino County Water Dist., 7337 Del Rosa Ave., sewer collection system and trunk lines. $2,000,000. Plans deposit $100. Daniel, Mann, Johnson & Mendenhall, 3325 Wilshire Blvd., Los Angeles, engrs.

BUILDINGS—BA

▲ **Calif., Los Angeles**—SCHOOL—BA 1/24—Bd. Educ., 1425 S. San Pedro St., constr. Cleveland High School. $4,000,000. CD 4/30.

▲ **Wash., Seattle**—SCHOOL—BA 1/24—School Dist. No. 1, 815 4 Ave. N., 1 and 2 story, 75,000 sq. ft. frame, rein.-con., masonry addns. to Ballard High School. $1,000,000. Plans deposit $50. T. Damm, 516 James St., Zone 4, archt. CD 7/10.

▲ **Calif., Ontario**—SCHOOL—BA 1/28—Chaffey Union College Dist., 4 and Euclid Sts., constr. Upland High School addns. $1,600,000.

HEAVY CONSTRUCTION—LB & CA

▲ **Charles L. Burch & Sons**, 2419 N. Chicago Ave., El Monte, Calif., CA $1,019,593, Proj. No. 6 East Compton Creek No. 2 Storm Drain Unit Three, LOS ANGELES, CALIF. Los Angeles Co. Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. Bids Dec. 13, awarded Dec. 24. CD 12/18, under LB.

BUILDINGS—LB & CA

Herbert Goldsworthy, 409 Santa Monica Blvd., Santa Monica, Calif., CA $870,000, est. $722,605, 1 story, type III, 28,000 sq. ft., Citrus Dist. COURTS and HEALTH BLDG., Spec. 1755, West Covina, LOS ANGELES, CALIF., Bd. Supervs. Los Angeles Co., 501 Hall Records, Los Angeles, Calif. Bids Dec. 11, awarded Dec. 24. CD 12/23, under LB.

▲ **James Stewart Co.**, 411 Central Ave., Phoenix, Ariz., CA $2,500,000, altering two ENGINEER BLDGS., SAN DIEGO, CALIF. Convair Div., General Dynamics Corp., 3165 Pacific Hy., San Diego, Calif. CD 5/4/56.

CANADA

BUILDINGS—LB & CA

Claude Legault Constr. Ltee., 5301 Henri Bourassa Blvd., Montreal, Que., CA Est. $800,000, 96 unit Montreal Low-rental HOUSING, Montreal North, MONTREAL, QUE. Central Mortgage & Housing Corp., 56 Lyon St., Ottawa, Ont. Allan Yentin, 6361 McLynn Ave., Montreal, Que., archts. Awarded Jan. 2. CD 8/30.

FOREIGN

BUILDINGS—LB & CA

▲ **E. D. Zublin & AHI-Bau**, West Germany, CA $15,000,000. concrete GRAIN SILO with piers, railroad and other facilities, BASRAH, IRAQ. Iraqi Grain Bd., Ministry of Economics, Mirjan Bldg., South Gate, Baghdad, Iraq. CD 12/18/56.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Tex., McAllen**—City, Wm. L. Schipp, mgr., City Hall, water laterals imprvs., $1,925,300; main canal imprvs., $1,682,600; off channel reservoir to provide water storage lake for new city filtration plant, $700,000; river (water) pumping plant, $313,200; relief water pumping plant, $56,800; water meters installations, $130,000; replacing and raising existing canal linings, $104,400; drainage imprvs., $87,000, all for providing City Water Supply. Sigler, Clark & Assocs., Mercedes, Tex., consult. engrs. CD 7/24/56.

(Continued on page 95)

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Jaeger gives you a lower, known cost for air

"MAKES" 600 CU. FT. OF AIR IN 1650 REVOLUTIONS ON 1.2 LBS. OF FUEL

Using the same GM 6-71 diesel engine, a Jaeger "600" delivers the same air volume at 1650 rpm that all other rotaries need 1800 rpm to produce.

In 8 hours' steady operation, a Jaeger averages 72,000 fewer revolutions, saving miles of engine piston travel and pounds of fuel. Because operation is always below the continuous horsepower curve, engine maintenance is lowest. As for the compressor unit, *many Jaegers have been operated more than 8000 hours without replacing a single vane.*

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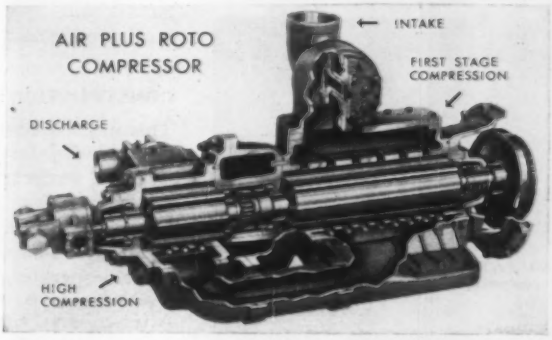

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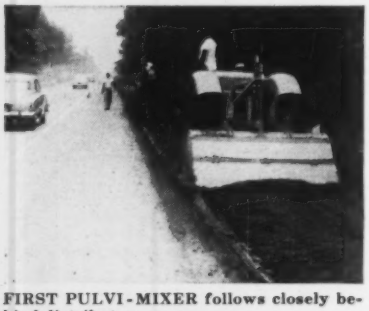
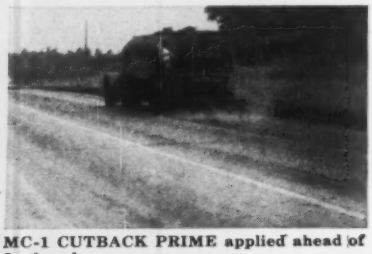
BITUMULS Base Stabilization of Shoulders on New Jersey Route S-41



FIRST PULVI-MIXER follows closely behind distributor.

PNEUMATIC ROLLERS in tandem on initial compaction.



MC-1 CUTBACK PRIME applied ahead of final seal.

● Typical of the speed and ease with which new safety and service can be built into existing highways is the work done last August along an eight mile stretch of Highway Route S-41, near Ellisburg, N. J.

Along each side of the 20 foot, rigid type pavement, a 10 foot width of sand-gravel base, 4 inches deep, had previously been placed and compacted to provide drainage. But it lacked stability, both under moving traffic and parked vehicles.

CONSTRUCTION METHOD

This in-place material was scarified, then bladed level. Over the loose scarified material, Bitumuls DM-1 was applied in two applications. Following each application, the material was mixed with two Pulvi-Mixers operating in tandem.

After mixing, the material was cut back to an even sub-grade line, then re-spread uniformly over the full 10 foot width. During blading and spreading, the mix had aerated sufficiently to allow immediate compaction. Pneumatic-tire rollers were used for initial compaction, with a final pass by tandem steel-wheel rollers.

This stabilized base was allowed to cure for one week, then surfacing proceeded as follows:

MC-1 cutback prime applied at the rate of 0.25 gal. per sq. yd. $\frac{3}{8}$" traprock applied over prime at the rate of 25 lbs. per sq. yd. Bitumuls RS-2 applied at the rate of 0.25 gal. per sq. yd. $\frac{3}{8}$" traprock again applied at the rate of 25 lbs. per sq. yd.

The shoulders were then thoroughly rolled.

In addition to holding costs to a minimum by making use of in-place material, Bitumuls Base Stabilization provides a fast, simple method of extending the service and safety of existing highways. *Full details on this method of shoulder construction are available from our office nearest you.*

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Baltimore 3, Md. St. Louis 17, Mo. Cincinnati 38, Ohio
Mobile, Ala. San Juan 23, P.R. Tucson, Ariz.
Inglewood, Calif. Oakland 1, Calif. Portland 7, Ore.

(Continued from page 92)

SEWERS, WASTE DISPOSAL

▲ **Tex., San Antonio**—City, City Hall, drainage in Mayberry and 36th Sts. to Apache Creek at Martin St. $1,047,000; drainage at Van Ness Proj., north of Fort Sam Houston, $266,000, Johnson & Marquie, 3012 Broadway, San Antonio, consult. engrs.; drainage S. Hackberry at Rockwood Creek to Oliver and Avant Sts. $611,000; drainage Rockwood Creek and Presa to Roosevelt $549,500; drainage from Clark and Fair Sts. to Hot Wells, and San Antonio River, $878,700, drainage Concepcion Creek at US Hy. 01 to the River $510,200; drainage W. Commerce at 19th St. to Apache Creek. $226,000. CD 10/29.

▲ **Ont., Toronto**—Etobicoke Twp., 4956 Dundas St. W., storm sewerage system for undeveloped land on both sides of Nos. 27 Highway between Bloor St. W. and Rathburn Rd. $2,000,000.

BRIDGES

▲ **Wash., Seattle**—King Co., Seattle, Wash., cancelled Mar. 11 bond election, floating bridge from Sand Point to Kirkland. $14,000,000. CD 12/27.

EARTHWORK, WATERWAYS

▲ **Massachusetts**—Commonwealth of Mass., Constr. Div., 20 Somerset St., Boston, (flood control) diversion Spot Pond Brook and filling in old channel-Middlesex Fells Reservation, Medford-Stoneham. $1,200,000. Constr. early 1958.

AIRPORTS

▲† **Md., Andrews Air Force Base**—AIRPORT IMPRVS.—S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., plans by Whitman Requardt & Assoc., 1340 St. Paul St., Baltimore, constr. primary runway, $3,000,000-$5,000,000; apron, operational. $500,000-$1,000,000; taxiway, apron access, $500,000-$1,000,000. CD 8/23/56.

PUBLIC BUILDINGS

▲ **Ala., Talladega**—SCHOOL—State of Alabama, Montgomery, voted bonds Dec. 22 for Alabama School for Deaf and Blind. $3,000,000. CD 10/2.

▲ **Ark., Fayetteville**—RESIDENCE HALL—University of Arkansas, T. C. Carlson, secy-treas., residence hall. $2,000,000. CD 3/30/56.

▲ **Ark., Little Rock**—RESEARCH CENTER—University of Arkansas Medical School, Dr. F. Douglas Lawrason, Provost, Little Rock, research center, on Medical School Campus. $2,300,000.

▲ **Calif., Berkeley**—RESIDENCE HALLS—Regents of University of Calif., Admin. Bldg., plans by Warnecke & Warnecke, 111 New Montgomery St., San Francisco, two 2 story rein.-con. residence halls to house 800 students. $3,500,000 each. CD 9/5/56. Bids in January.

▲ **Colo., Adams City**—SCHOOLS—School Dist. No. 14, plans by Alfred Watts Grant, consult. engr.-archt., 1640 Court Place, Denver, Rose Hill Elementary School Addn., school at 67th and Oneida; school in Adams City Area, and addns. to Senior High School at 69th and Cherry, $2,700,000. Bonds voted.

▲ **Conn., Winsted**—HOUSING—Winsted Housing Auth., Town Hall, low rental housing $1,000,000.

▲ **Ill., Springfield**—POWER PLANT—City, power plant addn. and new generating unit. $7,637,000, Burns & McDonnell, 95th and Troost Sts., Kansas City, Mo., engrs. CD 8/22/45.

▲ **La., Shreveport**—SCHOOL—Caddo Parish School Bd. plans by W. B. Wiener & Assoc., Commercial National Bank Bldg., Senior High School, $2,124,000. CD 9/14/51.

▲ **Mass., Clinton**—SCHOOL—Town, School Dpt., plans by S. W. Haynes & Assoc., Inc., 336 Main St., Fitchburg, high school between South Main St. and Rte. 110, $1,200,000. Constr. 1958. CD 4/24.

▲ **Mich., Chesaning**—SCHOOL—Bd. Educ., Chesaning School Dist., high school, M-47, $1,500,000.

▲ **Mo., Kansas City**—ADMINISTRATION, etc.—City, plans by Monroe & LeFebvre, Scarritt Bldg., Kansas City, Mo., administration bldg., women's dormitory, U-shaped men's dormitory, incl. dining hall, kitchen and warehouse for municipal prison farm, $1,796,000. CD 8/11/54.

▲ **Mo., Springfield**—SCHOOLS—Bd. Educ., Reorganized School Dist. R-12, James A. Jeffries, pres., 940 N. Jefferson Ave., $1,750,000 bond election April 1, school imprvt. program incl. 2 elementary schools, Senior High School addn., Junior High and 2 elementary school addns.

▲ **N. J., New Brunswick**—DORMITORIES—Bd. Trustees Rutgers University, College Ave., plans by Scrimenti, Swackhamer & Perantoni, 205 W Main St., Somerville, two 3 story bsmnt., brick, steel, and glass dormitories, Douglass College for Women, on site south of gardens of Wood Lawn. $2,595,000. CD 3/5.

▲ **N. Y., East Meadow**—COURT, etc.—Bd. Supervs. Nassau Co., Old County Court House, Mineola, children's court and probation dept. bldg. $1,500,000.

▲ **N. Y., Valhalla**—KITCHEN, etc.—Dpt. P. Wks., Westchester Co., County Office Bldg., White Plains, plans by York & Sawyer, 101 Park Ave., New York Zone 17, remodeling kitchen and dining room space $600,000; psychiatric division addn. and remodeling old division $1,222,000; residence bldg. for married internes and education bldg. $1,000,000, all foregoing at Grasslands Hospital. CD 3/22/56.

▲ **Tex., Gainesville**—SCHOOL, etc.—Dr. J. M. Kearnes, supt. Independent School Dist., Gainesville, voted bonds Dec. 17, high school, junior college and administration bldg. $1,500,000. Wilson, Patterson & Assocs., 601 Bailey St., Fort Worth, archts. CD 11/18.

▲ **Tex., Houston**—CITY HALL—City, Lewis Cutrer, mayor, City Hall, city hall addn. Approx. $1,000,000.

▲ **Tex., Wharton**—HOSPITAL, etc.—City of Wharton and Gulf Coast Medical Foundation, plans by Reber & Davidson, Wharton, 100 bed hospital and research center. $1,000,000. CD 10/19/56.

▲ **Vt., Burlington**—SCHOOL—City School Dpt., Burlington, Junior High School, Pine St. $1,000,000. Constr. 1958/59. CD 1/5/55.

▲ **Wash., Renton**—HOUSING—Renton Housing Auth., Renton, 100 low-rent housing units. $1,000,000.

▲ **Wash., Sunnyside**—SCHOOL—School Dist. 201, Yakima, $900,000 bond election Mar. 11, 86,217 sq. ft. masonry Junior High School, $1,000,000. D. Gochnour & E. Marble Miller Bldg., Yakima, archts. CD 12/23.

▲ **Wis., Waupun**—PRISON—State Dpt. Pub. Welfare, Madison, plans by Roger C. Kirckhoff, owner, prison. $5,000,000. Constr. late 1958.

▲ **Que., Montreal**—COURT and PRISON—City, City Hall, plans by Crevier, Lemieux & Mercier, 1065 Pratt Ave., 5 story old City Hall annex modernization, Court and Prison Bldg., Gosford St. $2,000,000. CD 8/13.

COMMERCIAL BUILDINGS

▲ **Calif., Berkeley**—HOTEL, etc.—Claremont Hotel, c/o Mgr., Claremont Hotel, 8 story hotel addn., incl. swimming pool, skating rink. $2,000,000.

▲ **Calif., San Francisco**—HOSPITAL—French Hospital, Administrators Office, Geary and 5th Ave., plans by John Carl Warnecke & Rex W. Allen, 111 New Montgomery St., 1st stage 200-bed hospital addn. $1,500,000. CD 7/1.

▲ **Colo., Denver**—OFFICE—Public Service Co. of Colorado, 15th and Champa Sts., plans by W. C. Muchow c/o Baume & Polivnick, 1225 Bannock St., 12 story, 175,000 sq. ft. office, 15th and Welton Sts. $6,000,000.

▲ **Ill., Glen Ellyn**—SHOPPING CENTER, etc.—George W. Prassas & Co., 111 W. Washington St., Chicago, shopping center and parking area, Roosevelt Rd. between Main St. and Park Blvd. $1,500,000.

▲ **Md., Annapolis**—LUXURY MOTEL, etc.—Revell Bay Corp., Donald F. Collins, pres., luxury motel, swimming pool, etc. $2,000,000. Hotel Corp. of America, lessee Constr. 1958.

▲ **Mich., Grand Rapids**—SHOPPING CENTER—Breton Village Center, Marvin Muller, 63 Jefferson St., S. E., plans by J & G Daverman Co., 924 Grandville, shopping center, Breton Rd. and Burton St., $4,000,000. CD 7/1/55.

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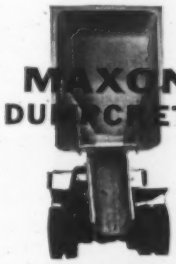

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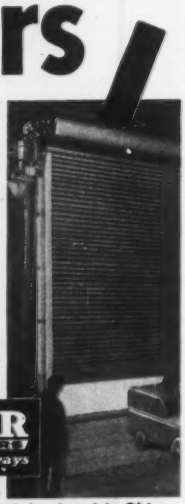

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▲ **N. Y., New York**—OFFICE—80 Pine, Inc., 415 Madison Ave., Zone 22, plans by Emery Roth & Son, 575 Madison Ave., Zone 22, 38 story office bldg., 80 Pine St. on block bounded by Pine, Water and Pearl Sts. and Maiden Lane, $20,000,000.

▲ **O., Avon**—HOUSING—A. Siegler & Sons, 5117 Lee Rd., Bedford, 500 home development. $10,000,000.

▲ **O., Cincinnati**—OFFICE—John Hibben Co., 7th and Walnut Sts., plans by Geo. H. Godley, 918 E. Court St., remodeling 6 story, office bldg., elevators, air-conditioning northeast corner 7th and Walnut Sts. $1,000,000. Maxfield & Edwards, Coppin Bldg., Covington, Ky., consult. engrs. Julius Cohen, 1027 Enquirer Bldg., staff engr.

▲ **Ore., Milwaukie**—RETIREMENT HOME—Oregon Senior Citizens, Inc., New Fliedner Bldg., Portland, plans by Harry C. Newton, 1429 W. 14th Ave., Beaverton. Retirement Home. $1,000,000.

▲ **Tex., Dallas**—HOSPITAL, etc.—Dallas East, Inc., c/o Walter B. Hallery Jr., c/o 10108 San Juan St., 226-bed hospital, $2,000,000; nurses home $350,000 east of here.

▲ **Tex., Dallas**—HOSPITAL—St. Paul's Hospital, 3121 Bryan, 500-bed hospital. $10,000,000.

▲ **Tex., El Paso**—OFFICE—Owner, c/o Leo R. Schuster, 1439 Rim Road, plans by Percy McGhee & Howard H. Dana, 1st National Bldg., 9 story office with 1st 2 floors for auto parking, 1800 N. Oregon St. $1,500,000.

▲ **Tex., Fort Worth**—HEADQUARTERS—Southwestern Bell Telephone Co., 308 S. Akard St., Dallas, division headquarters bldg., Main and Elgin Sts. $1,000,000. May not start job for 1 year.

▲ **Tex., Houston**—SHOPPING CENTER—Neuhaus Investment Co., Texas Natl. Bank Bldg., shopping center, 18-acre site area Mangum Rd. and W. 34 St. $1,000,000.

▲ **Tex., Orange**—SHOPPING CENTER—United Shopping Centers, Inc., c/o Chamber of Commerce, Orange, shopping center, 25 were sites at State Hy. 87. $2,350,000. Constr. in March.

▲ **Tex., Texas City**—HOTEL—Texas City Hotel Corp., c/o Dee Walker, chn., Community Planning Com., plans by Hedrick, Stanley & Lightfoot, archts.-consult. engrs., 5201 Fannin St., Houston, 6 story bsment hotel. $1,500,000, swimming pool, $75,000. CD 10/31, under Community Planning Committee, c/o Dee Walker, as owners.

▲ **Ont., Toronto**—OFFICE—Norwich Union Life Insurance Society, 12 Wellington St. E., office bldg., SE corner Queen and York Sts. $2,500,000.

▲ **Que., Montreal**—HOUSING—Central Mortgage & Housing Corp., 56 Lyon St., Ottawa, Ont., 97 three story apartment blocks, low cost housing, St. Genevieve, $2,102,700.

▲ **Que., Montreal**—HOUSING—Duquette & Blumenthal, 1875 Tillemont St., housing, 108 triplexes, de Salaberry St. $2,700,000.

INDUSTRIAL BUILDINGS

▲ **Mich., Grand Rapids**—WAREHOUSE, etc.—Spartan Stores, Inc., 1501 Buchanan, plans by J. & G. Daverman Co., 924 Granville St., warehouse, administration bldg., 44th and Fuller Sts. S. E., $2,000,000.

▲ **Mich., Livonia**—WAREHOUSE, etc.—Consumers Power Co., Jackson, plans by H. E. Beyster & Assocs., 700 Griswold Bldg., Detroit, Zone 26, warehouse and office, Farmington and Plymouth Rds. $1,000,000.

▲ **Mo., Kansas City**—PLANT—Western Electric Corp., 6585 Pennsylvania Ave., Pittsburgh, Pa., plans by Wm. B. Fullerton & Earl McCames, 15 W. 10 St., Kansas City, Mo., manufacturing plant, 2 story admin. bldg., 2-1,300,000 sq. ft. connected manufacturing bldgs. to manufacture telephone and electronic equip. $20,000,000. United Engineers & Constructors, Inc., 1401 Arch St., Phila., Pa., engr. CD 8/23.

▲ **R. I., Portsmouth**—POWER PLANT—Newport Electric Corp., 159 Thames St., Newport, power plant, Arnold Point. $1,000,000. Constr. 1958-59.

▲ **Tex., Longview**—PLANT—Texas Eastman Co., (Eastman Chemical Products, Inc., Marketing Subsidiary of Eastman Kodak Co., New York City, Longview, doubling plant capacity of polyethylene production bldg., on owners 2,400-acre site on edge of Longview, approx. $2,500,000. Constr. in January; storage bldg., $100,000, CD 8/21/53.

▲ **Sask., Moose Jaw**—CATALYTIC REFORMING UNIT—British American Oil Co. Ltd., 800 Bay St., Toronto, Ont., catalytic reforming unit producing 5,400 bbl. per day high octane reformed gasoline, $4,000,000. Constr. 1958.

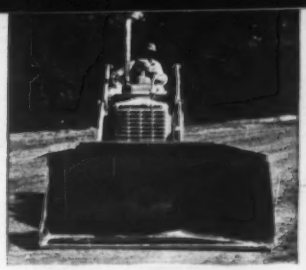
UNCLASSIFIED

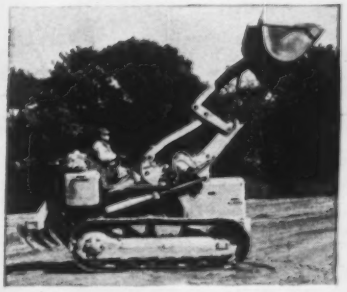
▲ **Conn., Madison**—PARK IMPRVS.—State P. Wks. Dpt., 165 Capitol Ave., Hartford, enlarge beach area, roads, Hammonasset State Park. $1,500,000.

▲ **Conn., Westport**—PARK FACILITIES—State P. Wks. Dpt., 165 Capitol St., Hartford, park facilities, roads, pavilion, concession station. $1,500,000.

▲ **New York**—PARKING FIELDS, etc.—Long Island State Park Comn., Administration Bldg., Belmont Lake State Park, Babylon, N. Y., 3 parking fields, boat basin, at Short Beach buildings and 4,440 ft. fishing pier. $15,000,000.

▲ **Wash., Seattle**—AMUSEMENT AND EXHIBITION BLDGS.—City, County-City Bldg., Zone 4, exhibition hall, $12,000,000; site imprvs., $5,750,000; bridge and amusement pier $8,000,000, in Puget Sound, planned for world's fair to begin in 1961.

Here  comes...

the TRAXCAVATOR'S  new...

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Overall height, level	14' 6"	12' 11 1/16"
Left side dump reach	24½"	25½"

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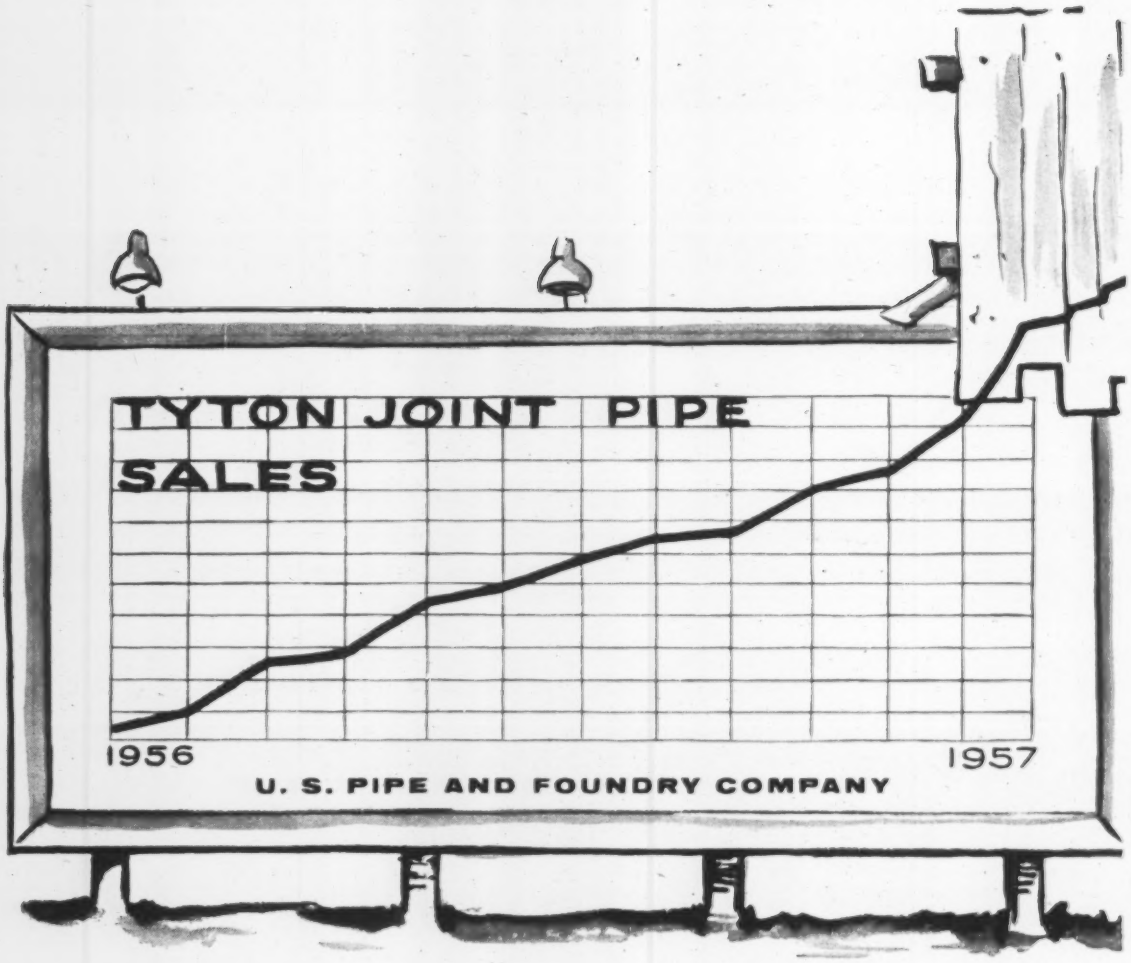

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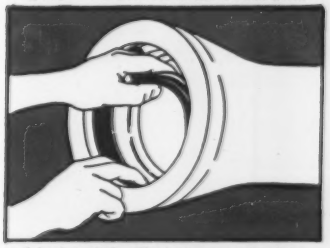
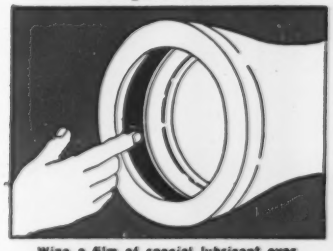
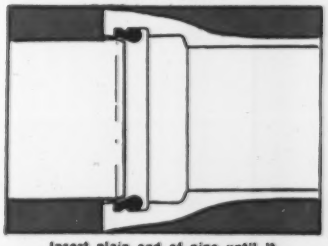


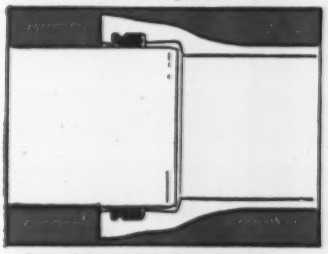
Insert gasket with groove over bead in gasket seat



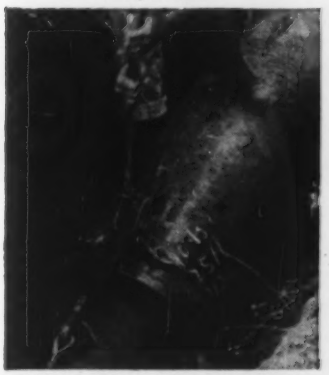
Wipe a film of special lubricant over inside of gasket



Insert plain end of pipe until it contacts gasket



Force plain end to bottom of socket . . . the job's done!



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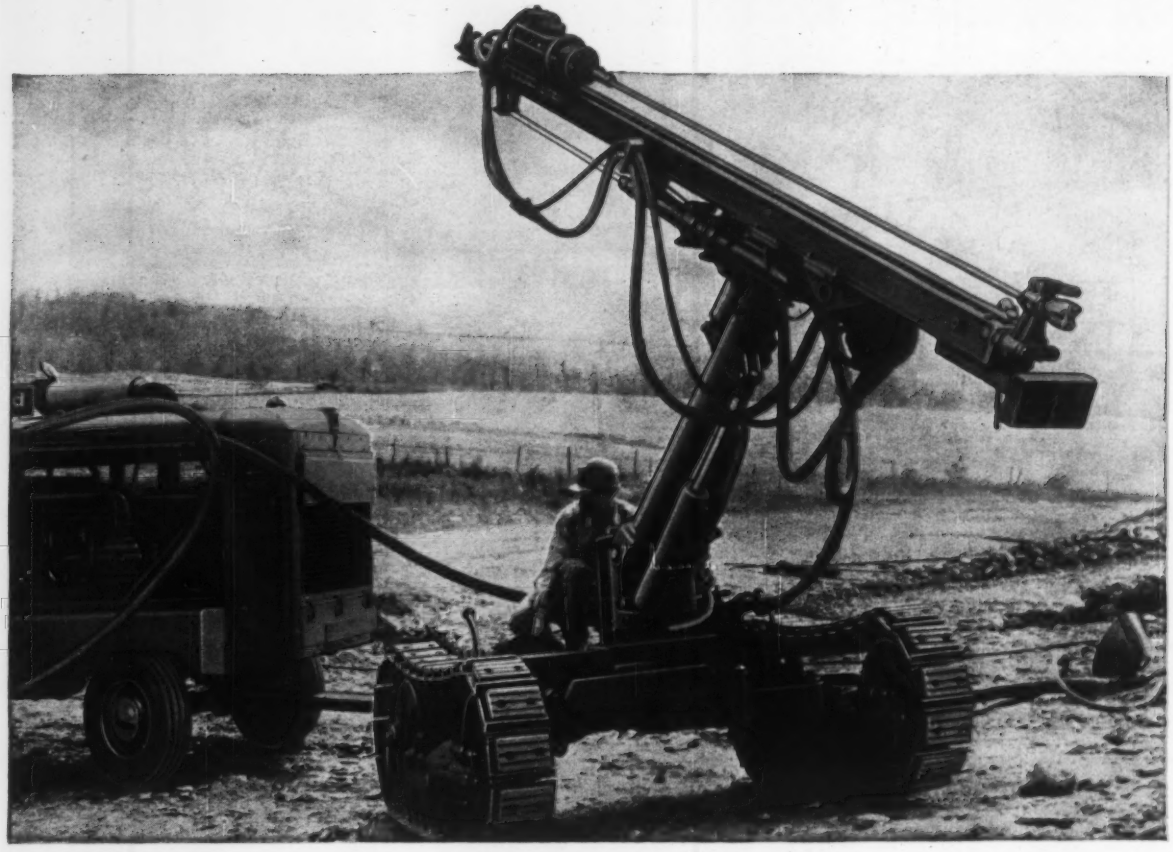

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NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
January 21 Massachusetts

BUILDINGS—LB & CA

▲ **Turner Constr. Co.**, 150 E. 42nd St., New York 17, N. Y., CA Est. $7,000,000, 10 story, limestone, brick, metal and porcelain enamel walls OFFICE BLDG., St. James Ave., BOSTON, MASS. Liberty Mutual Insurance Co., 175 Berkeley St., Boston, Mass. CD 12/18.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 28 Maryland
STREETS OND ROADS
January 21 New Jersey January 28, Feb. 4 Maryland

BUILDINGS—BA

▲ **N. Y., New York**—HOUSING—BA 1/21—New York City Housing Auth., 299 Broadway, New York, Zone 7, (1) foundations and appurtenances (2) general construction (3) foundations and general construction (4) heating and ventilating (5) electrical work (6) plumbing also furnishing, installing elevators for Senator Robert A. Taft Homes (Proj. NYC-2-28) Section 1, incl. Bldgs. 1 to 5 (inclusive) and Bldg. W. located in area bounded generally by E. 115 St., Madison Ave., E. 112 St. and 5 Ave., Plans deposit $75. Extended date. CD 12/11.

▲ **N. Y., Brooklyn**—HOUSING—BA 2/4—New York City Housing Auth., 299 Broadway, New York, Zone 7, Proj. NYC-33 (city) John F. Hylan Houses, incl. 206 apartments in areas bounded generally by Seigle St., Bushwick Ave., Moore St. and Humboldt St. Plans deposit $75. Extended date. Kealy & Patterson, 17 E. 49 St., New York, Zone 19, archts. CD 12/19.

▲ **N. Y., Brooklyn**—HOUSING—BA 2/4—New York City Housing Auth., 299 Broadway, New York, Zone 7, Proj. NYS-73, Bushwick Houses, incl. 1,220 apartments in areas bounded generally by Moore St., Bushwick Ave., Flushing Ave. and Humboldt St., Brooklyn Boro. Plans deposit $75. Extended date. Keally & Patterson, 17 E. 49 St. New York, Zone 19, archts. CD 12/19.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—Dpt. P. Wks., The Gov. Alfred E Smith State Office Bldg., Albany,
Lane Constr. Corp., 965 E. Main St., Meriden, Conn., CA $3,092,007, 4-lane divided section 5.51 mi. toll-free interstate Penn-Canada Expressway and 5.64 mi. access roads, starting at Sandy Creek about 1 mi. west of Rte. 11-178 intersection in Adams and extending northward to southern terminus of other Penn-Canada Proj. Jefferson Co. Bids Nov. 21, awarded Dec. 24. CD 11/22, under LB.

▲ **Merritt-Chapman & Scott Corp.**, 261 Madison Ave., New York, N. Y., LB $98,288,498 (4 bidders) main power plant, Niagara Project, Lewiston near Niagara Falls, Contr. N-3, NEW YORK. The Power Authority of State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. Bids Jan. 9. CD 12/16.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton, Bids opened 1/7,
Villa Const. Co., 233 North Ave., Westfield, N. ., LB $3,048,256, (9 bidders), grading, paving and bridges 3.977 mi. Rte. 102, Section 2B, from Still Valley to Central Railroad of N. J. crossing in Bloomsbury, Warren and Hunterdon Counties, FAI., CD 12/27.

BUILDINGS—LB & CA

▲ **Diesel Constr. Co.**, 625 Madison Ave., New York, N. Y., CA Est. $6,000,000. 19 story glass and aluminum BANK and OFFICE, 527 5th Ave. at 44 St. for Bankers Trust Co., NEW YORK, N. Y. Clarson Co. (Ivor B. Clark and E. S. Wolfson) 155 E. 44 St., New York, N. Y. Emery Roth & Sons, 575 Madison Ave., New York, N. Y., archts. James Ruderman 32 Union Sq. New York, N. Y., engr. CD 4/26.

▲ **Metropolitan Corp. of America**, 135 S. LaSalle St., Chicago, Ill., CA Est. $17,000,000-$20,000,000, four 20 story glass, steel APARTMENTS, Branch Brook site, NEWARK, N. J. Herbert S. Greenwald, 350 Fifth Ave., New York, N. Y. Ludwig Mies van der Rohe Assocs., 230 E. Ohio St., Chicago, Ill., archts. CD 2/13/52, under Public Buildings.

▲ **Village Constr. Co.**, Whobart Gap Rd., Livingston, N. J., Owner Builds, $4,000,000, two 6 and 8 story APARTMENTS, on Mountaintop Quarry, adjacent to Newstead, South Orange Ave., SOUTH ORANGE, N. J.

▲ **Consolidated Engineering Co., Inc.**, 20 E. Franklin St., Baltimore 2, Md., CA Est. $4,000,000, BASIC SCIENCE BUILDING, BALTIMORE, MD. School of Medicine Johns Hopkins University, 710 N. Washington St., Baltimore 5, Md. Bids Dec. 10. CD 11/22.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 28 North Carolina
STREETS AND ROADS
January 28 North Carolina

BUILDINGS—LB & CA

▲ **Beers Constr. Co.**, 70 Ellis St. N.E., Atlanta, Ga. CA $3,700,000. constr. GENERAL SERVICE HEADQUARTERS, ATLANTA, GA. Georgia Power Co., 52 Fairlie St. N.W., Atlanta, Ga. Bids Dec. 19. CD 12/6.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 21 Illinois January 28 Wisconsin
February 4 Michigan
STREETS AND ROADS
January 21 Illinois January 28 Wisconsin

BUILDINGS—LB & CA

▲ **Hagerman Constr. Co.**, 403 Strauss Bldg., Fort Wayne, Ind. CA Est. $3,500,000. 4 story, bsmnt., 250,000 sq. ft. DEPARTMENT STORE, Clinton and Wayne Sts., FORT WAYNE, IND. Wolf & Dessauer Co., 923 S. Calhoun St., Fort Wayne, Ind. Bids Nov. 18. CD 11/19.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 24 North Dakota
STREETS AND ROADS
January 23 Kansas January 24 North Dakota

BUILDINGS—BA

▲† **Tex., Beeville**—HOUSING—BA 2/7—Dist. P. Wks. Office, 8th Naval Dist., Naval Station, New Orleans, 40, La., 225-unit Capehart Housing to be located on 2 proposed sites in general vicinity of Beeville incl. all utilities, landscaping, streets, sidewalks, driveways and exterior electric distr. sys., etc. $3,000,000. CD 10/24.

BUILDINGS—LB & CA

▲ **Gasoline Plant Constr. Corp.**, M. Esperson Bldg., Houston, Tex., CA Approx. $3,650,000. NATURAL GAS TREATING PLANT, near PLEASANTON, TEX. Lone Star Producing Co., c/o South Texas Bldg., San Antonio, Tex. CD 1/9,
Lone Star Producing Co., Owner Builds, $80,000, pipe lines in vicinity of gas treating plant near here (Pleasanton, Tex.).

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 28 California
STREETS AND ROADS
January 29, 30 California

BUILDINGS—SLC

▲ **Ore., Portland**—HOTEL—Sheraton Corp., 212 Wood St., Pittsburgh, Pa., soon lets contract, 8 story hotel. $5,000,000. Church, Newberry, Roehr & Schuette, Bldrs., Exchange Bldg., Portland, Ore., and Perry, Shaw, Hepburn & Dean, Park Bldg., Boston, Mass. archts. CD 12/31.

HEAVY CONSTRUCTION—LB & CA

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,
Clyde W. Wood & Sons, Inc., Kirst Constr Co. and Alwood Corp., 6900 Tujunga Ave., North Hollywood, Calif., CA $5,052,434, 6 mi. freeway on U. S. Hy. 40 in Sierra Nevada between Hampshire Rocks and half mile west of Soda Springs, incl. 2 undercrossings and bridge over south fork of Yuba River, Placer and Nevada Counties. Bids Dec. 4, awarded Jan. 3. CD 12/6, under LB.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

Ministry of P. Wks., Caracas, Venezuela, rejected bids, 364 ft. high irrigation and power dam on Bocono River in southwestern part of VENEZUELA. LB $39,753,692. The Ministry said low bids did not comply with conditions of the bidding. CD 12/13.

(Proposal Advertisement see pg. 115 to 118)

SAUERMAN

Storage Methods...

REMOTE CONTROL
MATERIALS HANDLING

OUTDOOR STORAGE

Coke handling
is a Sauerman job at most delayed coking plants. This 4-yd. Drag-Scraper stockpiles by remote control from two operators' stations. (*Request Sauerman News 149.*)

INDOOR STORAGE

Any Bulk Material
can be handled by remote control with a Sauerman Machine. Personnel do not have to enter the area. (*Request Sauerman News 147.*)

Ask for Catalog E, Bulk Storage by Scraper, for complete description of the Sauerman Method.

SAUERMAN BROS., Inc. 632 S. 28th AVE. Linden 4-4892
BELLWOOD, ILLINOIS

GRAVITY-DUMP eliminates slow-acting body-hoists

There are no complicated mechanical body-hoists to slow up haul cycles — no expensive hoist replacement parts, maintenance or costly hoist down-time when you haul with Koehring Dumptor. *It has no body-hoist.* Operator trips the body-release lever, and *gravity* tilts the 6-yard body, dumps load instantly.

You get this one-second dumping action *every time,* under heaviest loads, in all temperature extremes, because *gravity-dump* never balks, never wears out. You gain an important production advantage, too. Saving 15 to 25 seconds on every dump adds up to a substantial increase in extra yards hauled per hour. For example —

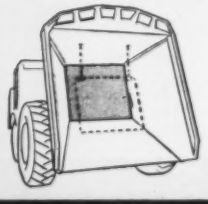
Increases output 9%

Take a typical 1,000-foot haul, where an ordinary dump truck would make 16 trips an hour. Allowing the same time to load, haul and return, Koehring Dumptor would average 17½ trips on the same cycle. That's because one-second dumping saves an average of 20 seconds dump-time on each trip — gains a total of 5.3 minutes more productive haul-time per hour. This is typical of Koehring Dumptor's basic principle — to reduce non-productive time to a minimum — and increase *work-time* for more yards per day.

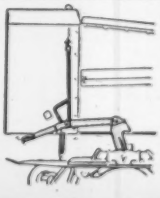
What's more, Dumptor *no-turn shuttle hauling* cuts another 15 to 30 seconds off cycle time. It operates at same speeds in either direction, travels round trip without turning. Call Koehring distributor *now.*

KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

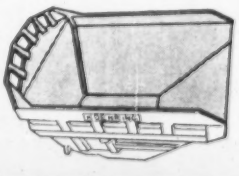
KB11



When dumping sticky materials, free-swinging kick-out pan breaks load suction. Pan bolts to floor, gives extra protection when loading rock.



Body latch for gravity-dump is simple and trouble-free. It's engaged by a single hook mounted on chassis. Handy dump lever is inside cab.



There are no bulges or ledges inside the streamlined, all-steel body. Top edge is box beam construction — sides and ends are rib-reinforced.

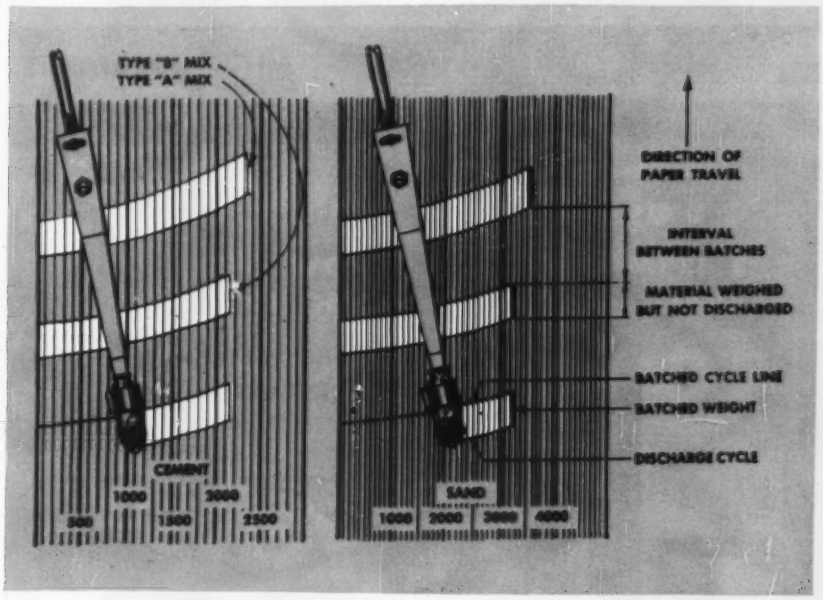
KOEHRING® heavy-duty DUMPTOR®

Other Koehring products: EXCAVATORS • CRANES • twinbatch® PAVERS • LONGITUDINAL FINISHERS • MUD JACKS®

BE SURE OF

correct batch-weight *and record*

with Johnson graphic recording



Today's big-production paving jobs require precision weigh-batching of aggregates and cement to conform with rigid highway and airport specifications. For this reason, it's important that you have a complete and accurate record of every batch weighed out at the plant. With Johnson automatic plants, and graphic pen-recording, you're always *sure* of accurate batch-weight and record. Here's why. There is *direct transmission* of weight from each batcher to individual dial scale on the control cabinet. (A portion of a typical pen-recording is shown above.)

All on one record

No need to match up 4, 5, or more charts to check a batch — all materials are recorded on one roll. Pens are carried on ends of arms, rigidly attached to the dial-unit pendulum shafts. Pen lines provide a quick way to check material batch-weights. They show return-to-zero of each pen, and immediately indicate any material hang-up during batcher charge or discharge. The line of the curve *tells at a glance* that all mixes are correct, as specified.

No expensive, pre-printed charts are necessary. Plain white paper is used. Chart is printed on the paper just before it passes the battery of pens. This eliminates any chance of error, where pre-printed charts might stretch or shrink. Paper is driven by small electric motor from supply roll, past the chart-inking rolls and pens, to the windup roll.

Stamps time and date

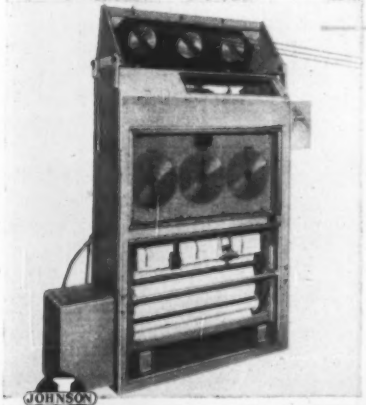
Each time a batch is discharged, the year, month, day, and time of day to *the nearest minute* are automatically stamped on the chart. No record is complete without this time and date information. And that's not all —

Batch-sequence stamp

With Johnson graphic recording, a separate stamp registers batch sequence number on the chart. The batch number positively identifies each batch for a complete, *permanent* record. Sequence stamp can be re-set to zero each day.

Moisture compensation

Johnson system also has a moisture-compensating beam at the batch controller which automatically shows dry weight on the sand dial. No need to change the mix for variances in moisture. You just set up the mix for dry weight, and adjust the compensator to the correct moisture percentage from time to time as needed. Beam also can be used for fine aggregates. For detailed information, see Johnson distributor, or send for new 36-page text-book catalog. It explains all phases of paving plant operation.



Used extensively on dam construction and commercial ready-mix plants, Johnson *job-proved* Batch Controller also provides paving contractors with practical "push-button" plant operation.

Simply by turning a selector knob on the control cabinet, operator can switch from a pavement mix to a structures mix. Just a turn of the selector changes mix on *all* batchers simultaneously.

(While 7 or 12 different mix selections are usually sufficient, Johnson Batch Controller also can be arranged for 120 different mix selections—with a "repeater" for automatic accurate re-batching.)

C. S. JOHNSON COMPANY, Champaign, Ill.
Send free catalog on "Concrete Paving Plants"

NAME_____

TITLE_____

COMPANY_____

STREET_____

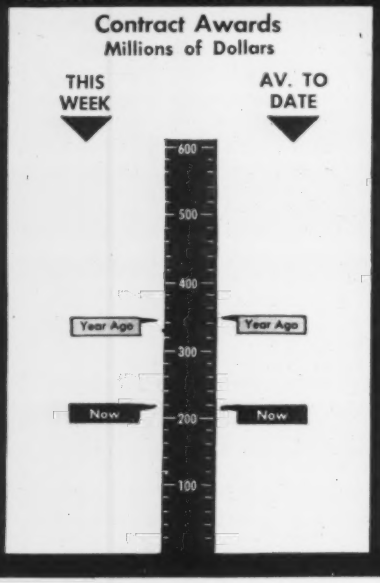
CITY, STATE_____

Koehring Subsidiary 3757 ENR

C. S. JOHNSON CO., CHAMPAIGN, ILL. • STOCKTON, CALIF.

Construction Scoreboard

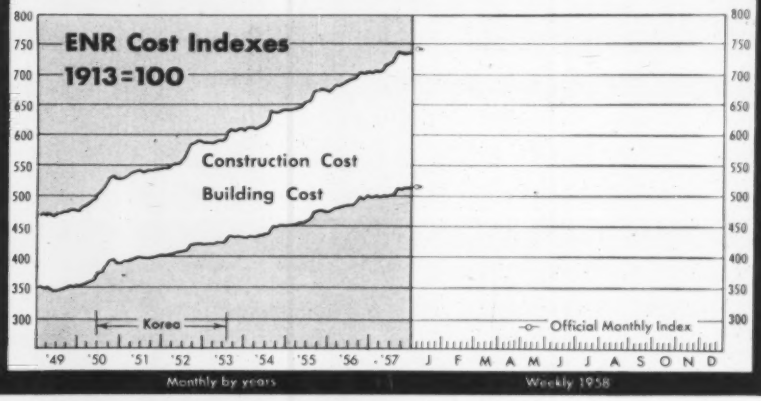
ACTIVITY THIS WEEK



COST INDEXES AS OF NOW

ENR INDEXES (1913=100), 20-cities' average	Week of Jan. 9 1958	% Change from Dec. 12 1957	% Change from Jan. 10 1957
Construction Cost	743.45	+0.8	+4.9
Building Cost	516.40	+0.1	+2.7

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 1958 millions	3 wks Chge '57-'58 %
All Heavy Construction	$219.9	$650.1	−37
Private	105.1	287.9	−38
Public	114.8	362.2	−36
State & Municipal	80.1	297.9	−29
Federal	34.7	64.3	−63
By Type of Work			
Public			
Waterworks	3.8	13.1	+130
Sewerage	8.1	42.4	+16
Bridges*	2.4	9.3	−74
Highways	30.2	118.1	−21
Earthwork, Waterways	8.5	11.9	−89
Buildings, Excl. Housing	28.2	105.3	−23
Housing	19.7	34.8	+105
Unclassified	13.9	27.3	−64
Private			
Mass Housing	46.3	100.1	−50
Commercial	36.3	56.6	+30
Industrial	15.2	97.1	−51
Unclassified	7.3	34.1	+42

*Includes private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

	Week of Jan. 9 millions	Cum. 1958	2 wks Chge '57-'58 %
Corporate Securities	$22.6	$35.1	−86
State and Municipal:			
All Except Housing	29.6	296.2	+779
Housing	...	0.1	...
Federal Loans	1.2	4.6	−33
Federal Aid	...	...	...
Total Nonfederal	$53.4	$335.9	+15
Federal Appropriations:			
Projects in U. S.	...	...	...
Outside U. S.	...	...	...
Total New Capital	$53.4	$345.9	+15

CONTRACTS AWARDED

	1957 Dec. (millions)	12 Mos. (millions)	% Change from 1956 Dec.	12-Mos.
Total U. S., ENR reported	$966.9	$17,985.8	−39	−17
Private	409.8	8,385.5	−61	−38
Public	557.1	9,600.3	+ 1	+17
State and Municipal	504.8	7,415.4	+17	+14
Federal	52.3	2,184.9	−57	+29
ENR Volume Index, 1913=100	356	517	−43	−23

NEW CAPITAL FOR CONSTRUCTION

Total U. S.	$501.9	$16,653.3	−32	+17
State and Municipal Bond Sales	368.2	5,802.9	−12	+21
Corporate Security Sales	120.0	5,683.1	−60	+20
Federal Loans, Aid (nonfederal work)	13.7	2,361.3	−46	+92
Federal Appropriations (federal work)	0	2,806.0	....	−19

*Includes funds for outside U. S.

MATERIALS SHIPMENTS

Unit	1957 Sept. (S) Oct. (O) Nov. (N)	Cum. (No. of Mos.)	Percent Change from Year Ago Mo.	Cum.
Portland Cement, Bur Mines, thous bbls	30,847(O)	263,447(10)	− 2	− 2
Conc Paving Awards, PCA, thous sq yd	3,950(N)	82,297(11)	−23	+ 5
Fabricated Structural Steel, thous tons	293(N)	3,374(11)	+ 6	+16
Bookings, AISC, thous tons	188(N)	2,654(11)	−45	−26
Reinforcing Bars, Net, AISI, thous tons	142(N)	2,186(11)	−43	− 4
Lumber, NLMA, mil fbm	2,473(N)	31,350(11)	−12	− 8
Orders, mil fbm	2,367(N)	31,148(11)	−13	− 8
Production, mil fbm	2,493(N)	31,199(11)	−16	−11
Douglas Fir Plywood, DFPA, 3/8" basis				
Production (aver per week), mil sq ft	104.3(N)	104.1(11)	+ 2	+ 4
Orders (average per week), mil sq ft	93.0(N)	102.6(11)	− 5	+ 6
Clay Products, Bureau of Census				
Brick, Ungl, Common, Face, mil bri	569.8(S)	4,629.2(9)	−0.2	−11
Vitrified Clay Sewer Pipe, thous tons	150.0(S)	1,269.0(9)	−11	−11
Structural Tile, Unglazed, thous tons	46.1(S)	453.2(9)	−17	−12
Asphalt Products, Bureau of Census				
Asphalt Roofing, thous sales sqs	6,090(O)	47,292(10)	+ 2	− 8
Asphalt Siding, thous sales sqs	133(O)	982(10)	− 8	− 4
Aluminum, Wrought, Net, Bur Census				
Sheet and Plate (non-heat treatable), mil lbs	84.2(O)	822.8(10)	− 7	−10
Wire and Cable, mil lbs	24.0(O)	237.0(10)	− 6	− 7
Extruded Shapes (soft alloys), mil lbs	61.2(O)	543.9(10)	−0.03	−0.03

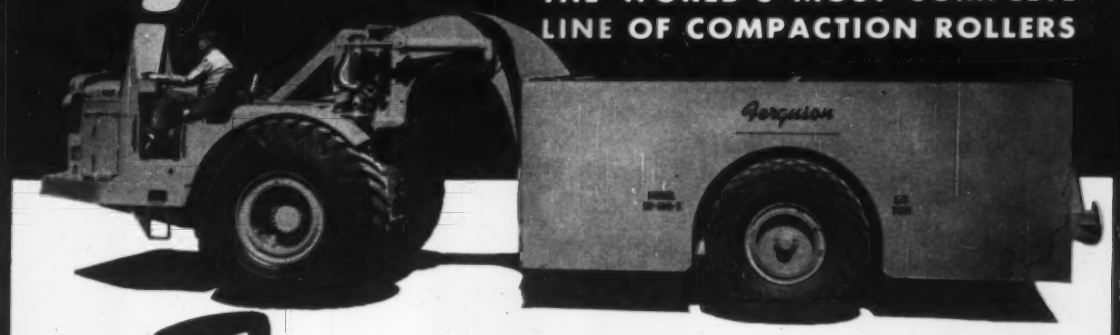
EMPLOYMENT AND FAILURES

Contract Const Employment, BLS, thous	3,037(N)	3,040(11)**	− 4	+ 2
Contractor Failures, Dun & Bradstreet				
Number	194(N)	1,931(11)	+13	+17
Liabilities, thous	$13,420(N)	$104,599(11)	+21	+13

**Average per month

THE Ferguson LINE...

THE WORLD'S MOST COMPLETE LINE OF COMPACTION ROLLERS

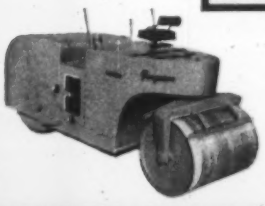


THE Ferguson 50 TON RUBBER TIRED ROLLER

For the compaction of large yardages, the FERGUSON 50-ton is standard throughout the world. Tire pressures from 90# to 150# p.s.i. Available with gooseneck tongue for all rubber-tired tractors or straight tongue for crawler tractors. Will compact 15,000 cubic yards per day, depending on soils.

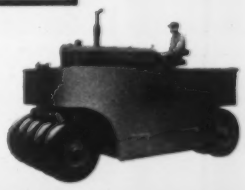
Also available in 60, 100 and 200 ton sizes.

ROLLERS FOR EVERY PURPOSE



We manufacture tandem rollers in 2-3, 3-5, 5-8 and 8-12 ton sizes.

Ferguson and Gebhard tamping rollers are built in all practical types and sizes.



Ferguson self-propelled rubber-tired rollers in 10, 12 and 25 ton models. Gasoline and diesel engines.

manufactured by

WRITE FOR BROCHURE No. 417

SHOVEL SUPPLY COMPANY

4900 HINES BLVD. • P. O. BOX 1369 • DALLAS, TEXAS

INTERNATIONAL all-wheel-drive models cover the range from 7,000 lbs. GVW to 43,000 lbs. GVW in conventional and cab-forward design. There is one practically custom-built in the world's most complete truck line for every hauling job. Widest choice of load-moving and load-carrying components to keep operating and maintenance costs lowest.

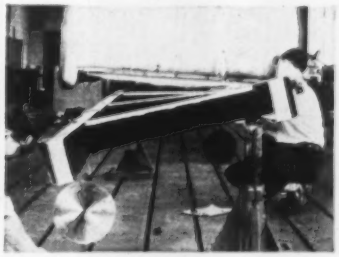
Here's a unique all-purpose vehicle—the new INTERNATIONAL Travelall® with all-wheel-drive. Has half again more load space than any other "wagon." Truck-built to take off-highway punishment with 2000-pound-plus loads. Or use it as a full personnel vehicle with plenty of room for eight men. Also available with conventional drive.

INTERNATIONAL TRUCKS

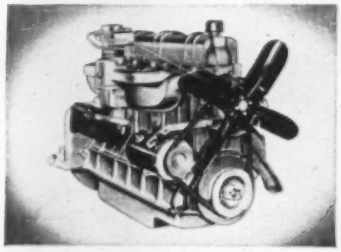
Traction when you need it!

Just one reason why contractors find International Trucks cost least to own!

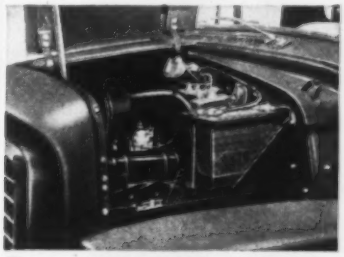
Negotiate rougher terrain—carry more load in less time—cut operating expenses with rugged all-wheel-drive.



Superior strength Steel-Flex frames test-proven to combine durability with proper flexibility for extra truck life.

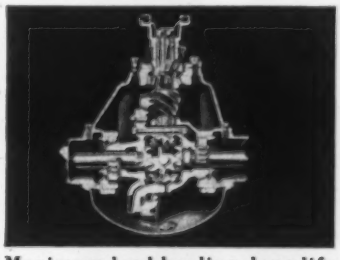


Dependable gasoline or LPG "six" power and economy backed by INTERNATIONAL all-truck engine leadership.



Easy servicing. Units in the wide engine compartment under the hood are located for quick, uncramped servicing.

Easy to handle in tight spots or on the roughest terrain with true geometric steering, cam and roller mounted gears.



Maximum load hauling, long life axles. Front and rear axles are full floating single reduction type.

INTERNATIONAL Trucks with *all-wheel-drive* are truck-built tough to make roads where there are none.

You get more traction, more sure-footed power because *all wheels are working*. They move you over sinkholes, mud, sand or snow . . . they grab hold to pull business-sized loads up the steepest grades.

What's more, *every* all-wheel-drive INTERNATIONAL Truck is all-truck manufactured in one plant. You get dependable performance that makes the most out of every workday, plus lasting economy of operation and long life. That's why INTERNATIONAL Trucks cost *least* to own. Fleet cost records prove* it.

When it's time that you need a truck, remember the line that's been heavy-duty sales leader for over a quarter of a century. Then see your INTERNATIONAL Dealer.

**Signed statements in our files, from fleet operators throughout the U.S., back up this statement.*

cost least to own!

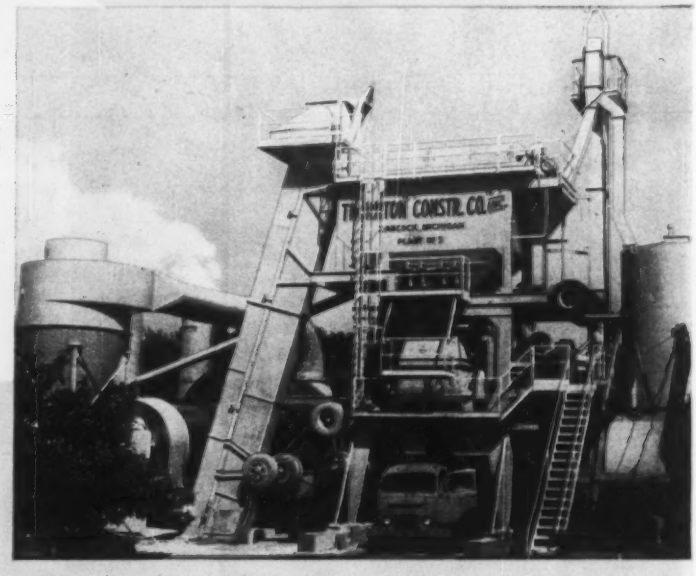
INTERNATIONAL HARVESTER COMPANY, CHICAGO

Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

BIG MADSEN
6000-LB. ASPHALT PLANT

...handles bituminous mix requirements for approaches and surfacing of World's Longest Suspension Bridge

THORNTON CONSTRUCTION COMPANY, INC. of Hancock, Michigan used this big MADSEN Model 481 6000-lb. Batch Capacity Asphalt Plant for producing 6400 tons of bituminous concrete mix for the approaches and surfacing of the Mackinac Bridge. Plant is located at St. Ignace, Michigan, about 2 miles from the Bridge.



Ability to turn out big-volume production day-in and day-out together with superior engineering that results in faster production and less maintenance... are important money-making qualities that have made leading contractors choose MADSEN Asphalt Plants.

Let's take a look at some of the MADSEN features built into this THORNTON CONSTRUCTION COMPANY's big MADSEN Plant.

● FULLY AUTOMATIC OPERATION (Optional in MADSEN Plants) ... By pressing a single button, operator weighs out aggregates and asphalt – discharges materials into the mixer – dry mixes and wet mixes – and dumps mix into waiting trucks. Unit will recycle as many batches as desired up to 400. Three different specification mixes can be made by merely flipping the selector switch to the mix desired.

● RUGGED 6000-lb. MADSEN TWIN-SHAFT PUG MILL MIXER ... Has a capacity of 64 cu. ft. below center line of mixing shafts and a net capacity, level full, of 135 cu. ft.

● COMPLETE PORTABILITY... Transport wheel equipment furnished for screen-bin section, mixer-weigh-box section, hot stone elevator and dryer. (Dust collector and dust washer to be wheel-equipped at later date.)

● 4-COMPARTMENT, 50-TON CAPACITY BIN ... Exclusive MADSEN design (3 openings in each bin compartment) eliminates segregation and speeds up charging of weigh-box.

● 120 CU. FT. (LEVEL FULL) CAPACITY WEIGH-BOX ... Has air operated gate, and 4-point lever suspension – roller-mounted so that it may be quickly rolled out of the way for field maintenance.

● MADSEN 96" x 40' COUNTER-FLOW DRYER ... Unit is capable of drying upward of 180 tons of aggregate per hour to a .018% moisture content.

● 12-FT. DIAMETER CYCLONE DUST COLLECTOR ... Equipped with MADSEN Exhauster.

● MADSEN TRIPLE WET TUBE DUST WASHER ... Has met air pollution requirements everywhere.

MADSEN *Equipment that Serves*

Ask your MADSEN Distributor for the complete story or write MADSEN WORKS Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, P.O. Box 38, La Mirada, California

FOR YOUR CONVENIENCE—MADSEN MAINTAINS A COMPLETE PARTS STOCK IN LOS ANGELES AND LIMA, OHIO

THE MADSEN LINE OF PRODUCTS
FOR THE ASPHALT PAVING INDUSTRY

ASPHALT PAVING PLANTS • PUG MILL MIXERS • AGGREGATE DRYERS • DUST COLLECTOR UNITS
ROAD PUG TRAVEL-MIX PLANTS • WEIGH BATCHERS • SUPER FLOAT AND JOHNSON FLOAT FINISHERS
ASPHALT TANKS • ROYAL CROWN PUMP VALVES • ASPHALT AND FUEL PUMP UNITS

BALDWIN BLH LIMA-HAMILTON

MADSEN WORKS
BALDWIN-LIMA-HAMILTON
CONSTRUCTION EQUIPMENT DIVISION
DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation • Hamilton • Lima • Loewy-Hydropress • Madsen • Pelton • Standard Steel Works

Economic Shoe-Pinch

Delaware to cut building; Connecticut to speed it

What the Delaware legislature started two weeks ago in a move to stave off a $27 million deficit, Gov. J. Caleb Boggs apparently finished last week. The lawmakers boosted existing taxes to bring in an additional $21 million in revenue (ENR Jan. 9, p. 100), and Governor Boggs recommended budget slashes of $5.5 million.

But Gov. Abraham A. Ribicoff of Connecticut saw the generally declining economic situation in a different light. He announced that public works projects already authorized would be speeded in an effort to ease the impact of unemployment in his state.

• **Highways, schools to suffer**—In Delaware, highway and school construction will be most severely hurt. Governor Boggs' revisions of the budget already authorized for the 1959 fiscal year starting July 1 would reduce expenditures for highways and schools by $3.8 million to a new total of $54.6 million.

He also recommended repeal of several supplementary appropriations bills, including one providing $1.2 million annually to municipalities for local street improvement. Other suggestions would cut $400,000 from the State Highway Department's maintenance fund and $100,000 from mosquito control.

Governor Boggs said that affirmative action by the legislature on his recommendations, combined with the new revenue measures, would leave the state with a surplus of $1.4 million on July 1, 1959, the end of the fiscal year.

• **Connecticut public works**—Governor Ribicoff made his announcement after seeing last week's claims for jobless benefits. They totaled 64,287—double those for the same week of last year.

About $181 million in such projects are authorized but have not yet been started.

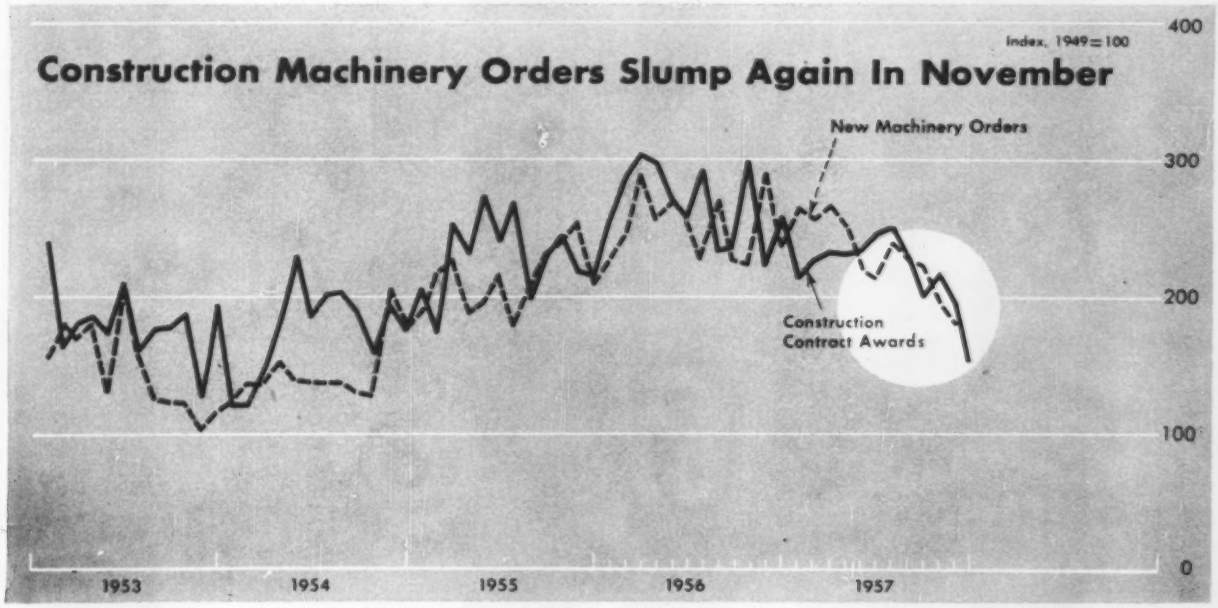
Some More Help

Closing costs allowed in mortgage; discounts hiked

Federal Housing Administration and Federal National Mortgage Association (Fannie Mae) last week moved to aid housing. The FHA, rescinding an April 1955 ruling, now will allow closing costs for a house to be included in the mortgage, provided the loan is less than the appraised value of the house. In addition, the agency boosted allowable discounts for FHA-insured mortgages in the Far West, Southwest and parts of the South—areas where mortgage funds are tightest. But in some New England states and northern Virginia, the allowable mortgage discounts were reduced.

The actions follow lowering of take-home pay requirements (ENR Jan. 9, p. 101).

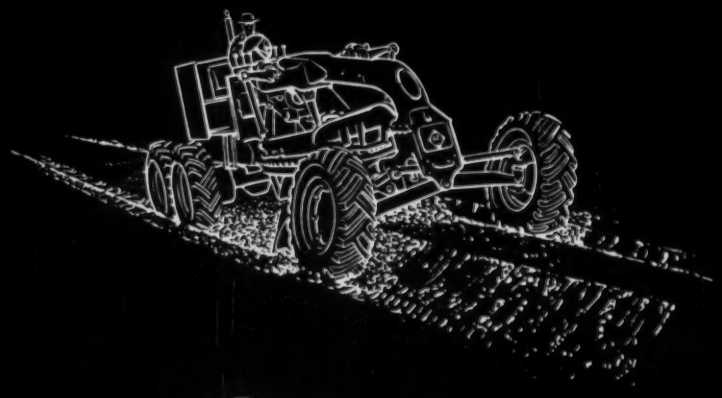
Fannie Mae will pay ½% more for mortgages from lending institutions in the secondary mortgage market.



New Orders Index Has Fourth Consecutive Dip

Contractors continue to trim their orders for new construction machinery because of the downtrend in construction contract awards. As a result, new orders for machinery declined in November for the fourth consecutive month on the McGraw-Hill Economics Department index. The latest value on the index is 182 based on 1949=100. This is the lowest rate of new orders since July 1955. It is the lowest for the month of November since 1953.

The Machinery Orders Index of 182 for November compares with the index of 196 for the value of heavy construction contracts reported by ENR during the month. The contract awards index dropped again in December to 154. This is the lowest monthly rate of awards since March 1954, and is the smallest for December since 1952.

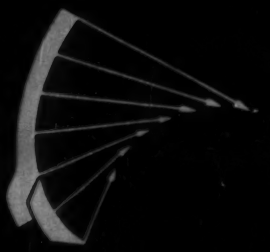


the design of the blade makes

ALLIS-CHALMERS engineering in action

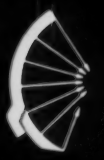
. . . an Allis-Chalmers motor grader exclusive

THE ROLL-AWAY MOLDBOARD MOVES BIG LOADS FASTER



Each portion of blade forces material toward a *different* point. Packing is eliminated. Pressure and friction against blade decreases toward top of blade — no wasted power.

ORDINARY MOLDBOARD



Each portion of blade forces material toward a *fixed* point. Packing action causes high friction over entire blade — wastes power.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

the difference

ROLL-AWAY

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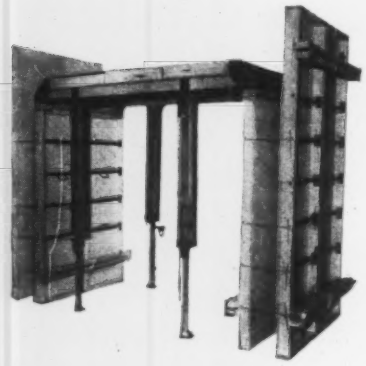
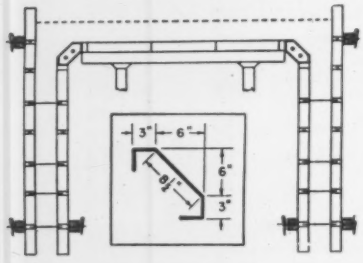
Culvert Forming



Symons Develops New Haunch Form for Culverts

Symons Safety Shores Used to Support Slab

Symons now has a new 9 x 9 inch steel haunch section designed to connect Symons standard wall panels and slab panels for the monolithic pouring of culverts. This new section provides for a 3-inch face on the roof slab and



on the wall with a 45-degree-angle surface 8½ inches wide between wall and roof. No built-up forms or other special equipment is necessary.

Made of 11-gauge hot rolled steel this new section is available in 4, 6, and 8 foot lengths. It can be used with either metal frame or wood frame forms. Symons regular form hardware is used for securing the steel section to Symons standard forms. No special fittings are required.

Symons forms, shores and column clamps may be rented with purchase option. FREE literature on Symons products is available upon request.

Symons

SYMONS CLAMP & MFG. CO.

4265 Diversey Avenue, Dept. A-8
Chicago 39, Illinois

Construction in Place Tops '56

The dollar volume of new construction put in place during 1957 totaled $47.3 billion to set a new record. The total was up 3% from 1956 and according to the joint report of the U. S. Departments of Labor and Commerce, 1957 was the thirteenth consecutive year in which a new record was established.

Both private and public construction expenditures in 1957 reached new levels, though the $33.3 billion of private work was only a shade above 1956 levels. But public construction mounted to $13.9 billion, 9% over 1956, with gains registered in all but two types of projects—military facilities off 9% to $1.3 billion and water systems off 2% to $562 million (see table below).

In private work the largest declines were recorded for new dwelling units—down 10% to $12.2 billion—and stores, restaurants and garages down 12% to $1.7 billion. However, it was still the third best year on record for dwelling unit construction.

New records also were set for additions and alterations to residential buildings, which rose 6% over 1956 to $3.9 billion; for nonhousekeeping units (hotels, dormitories, tourist courts), which were 12% higher at $499 million; for industrial buildings, up 3% to $3.2 billion; for office buildings and warehouses, up 11% to $1.9 billion; and for religious, social and recreational, hospital and institutional buildings.

Public utilities added $5.8 billion in construction to the private segment in 1957, a 14% gain over 1956.

Construction Put in Place: December and 1957

Reported by U. S. Department of Labor and Commerce

Type of Construction	Dec. 1957 (mil)	% Chg. From Nov. 1957	% Chg. From Dec. 1956	Year—1957 Amt. (mil)	% Chg. From '56
TOTAL CONSTRUCTION	**$3,667**	**−11**	**+ 3**	**47,255**	**+ 3**
Private Construction	2,705	− 8	+ 2	33,313	+ 0.2
Residential Buildings (nonfarm)	1,345	− 9	− 1	16,571	− 6
New Dwelling Units	1,005	− 8	− 4	12,160	−10
Additions and Alterations	290	−15	+ 5	3,912	+ 6
Nonhousekeeping	50	− 2	+25	499	+12
Nonresidential Buildings	764	− 5	− 1	9,138	+ 4
Industrial	248	− 1	− 9	3,162	+ 3
Commercial	305	− 8	0	3,570	− 2
Office Buildings and Warehouses	172	− 4	+10	1,864	+11
Stores, Restaurants, and Garages	133	−13	−10	1,706	−12
Other Nonresidential Buildings	211	− 4	+ 9	2,406	+14
Religious	74	− 5	+ 4	868	+13
Educational	44	− 4	− 4	519	− 3
Hospital and Institutional	48	− 2	+50	505	+54
Social and Recreational	27	− 4	+ 4	309	+12
Miscellaneous	18	0	0	205	+ 5
Farm Construction	100	−12	+ 3	1,590	+ 2
Public Utilities	483	− 9	+17	5,830	+14
Railroad	35	− 5	− 3	450	+ 5
Telephone and Telegraph	86	0	− 2	1,080	+ 1
Other Public Utilities	362	−11	+25	4,300	+19
All Other Private	13	− 7	+30	184	+53
Public Construction	962	−18	+ 8	13,942	+ 9
Residential Buildings	57	+ 2	+90	510	+75
Nonresidential Buildings	342	− 6	+ 6	4,481	+10
Industrial	32	− 3	−29	458	+ 1
Educational	226	− 4	+12	2,832	+11
Hospital and Institutional	24	− 4	+ 4	333	+12
Administrative and Service	29	−15	0	434	+20
Other Nonresidential Buildings	31	−16	+19	424	+ 3
Military Facilities	88	−18	−10	1,275	− 9
Highways	275	−33	+15	4,840	+ 8
Sewer and Water Systems	97	− 9	− 3	1,347	+ 6
Sewer	61	− 9	+ 9	785	+12
Water	.....	−10	−18	562	− 2
Public Service Enterprises	25	−19	− 7	393	+ 2
Conservation and Development	71	−17	+ 9	975	+18
All other public	7	−22	0	121	+16

Homebuilders Fight for a Voice

Chicago and Fresno groups lead effort to prevent homebuilders from being tail to others' labor kites

A search by the nation's homebuilders for an effective voice in collective bargaining was squelched last month in Chicago, Ill., and took an ironic turn in Fresno, Calif.

On December 24, the National Labor Relations Board denied the Chicago Metropolitan Home Builders Association the right to bargain independently with the carpenters union. And on January 3, a split between Northern California homebuilders and the Associated General Contractors dramatically opened the door to the United Construction Workers union (a division of the United Mine Workers' District Fifty), which signed a 16-month contract with the Home Builders Association of San Joaquin Valley.

Big question symbolized by the two events is whether the homebuilding industry—largest segment of the construction industry—should have something to say about the labor costs that affect its continued existence. If the answer is "yes," the problem is "how?".

• **Progress**—Through the National Association of Home Builders and through local associations, homebuilders have tried to solve the problem in two ways.

Operating within the present framework of collective bargaining, they have attempted to obtain sufficient recognition by contractors in heavy, commercial and industrial construction to participate actively in their joint negotiations with building trades unions. They also have tried to establish the right to bargain directly and separately with the unions whose members they employ.

Both procedures have met with a mixture of success and failure.

In 14 of the nation's 20 largest cities, homebuilding is done under union conditions. Labor contracts are negotiated jointly in Los Angeles, Detroit, San Francisco-Oakland, Kansas City and Portland, Ore. Separate negotiations are conducted in New York, Philadelphia, Cleveland, St. Louis, Buffalo and Seattle.

But in other areas—as in Chicago—the pudding is curdled.

• **Complaint from Chicago**—Complaint of the Chicago group is that "a major industry in the metropolitan Chicago area has been and is being denied the right to have anything to say about the wage rates and other economic benefits which it pays to a large segment of its employees, namely, carpenters and carpenter apprentices."

For over half a century, the Builders Association of Chicago, which embraces 200 general contractors (mostly in heavy construction), has negotiated with the District Council of Carpenters on an association wide basis. Through a committee of five (all in commercial, industrial and institutional building) it concluded a five-year labor contract with the carpenters last June 1. The homebuilders say they were told that "no plan could be devised" which would permit their association "to become a party to the collective bargaining agreements."

On several occasions, the homebuilders tried unsuccessfully to discuss separate negotiations with the union. Along the line, a number of homebuilders individually signed short-form agreements with the union committing themselves to the wage rates set by the BAC contract.

On May 28, the Homebuilders Association filed a representation petition with the NLRB asking that the carpenters employed by its members be decreed an appropriate bargaining unit.

The petition was turned down by a board panel of three members and the association is back where it started. In the face of defections by individual members, the board said the association failed to establish that it is the collective bargaining representative for its members. Also, no history of multi-employer bargaining by the homebuilders was apparent to the board. "It is well settled that a single employer unit is presumptively appropriate," it said, "and that to establish a claim for a broader unit a controlling history of collective bargaining on a broader basis by the employers and the union involved must exist."

• **Paradox**—The National Association of Home Builders had thrown its weight behind the Chicago group in the proceeding, and presented the board with an impressive array of facts and figures pointing up the significance of the homebuilding industry in the nation's economy and its separate and distinct problems. [Founded in 1942, NAHB has 300 local affiliated associations—multi-employer units—embracing 40,000 members (ENR Oct. 31, 1957, p. 81)].

During the last 25 years, it said, homebuilding has been lifted out of a craft status to become a "new national industry" doing some $20 billion worth of work a year. By far the largest single segment of the construction industry, it noted, it provides 2½ million jobs a year, with over half its dollar volume coming from areas operating under union conditions.

In Chicago, for example, residential homebuilding accounted for over half the gross dollar volume of Chicago construction in 1956; homebuilders employed more carpenters than the general contractors did; they provided greater stability of employment.

According to the Chicago group, their carpenters are more versatile, have higher skills. And they noted that, unlike the general contractors, the homebuilders build on speculation, and finance the cost of construction. They also have to cope with land acquisition and development costs and problems.

But despite their proportionate strength and interest, their distinct problems and situations, they are often the tail to someone else's kite in collective bargaining.

The Chicago group has asked the NLRB to reconsider its decision. It says the ruling threatens to drive the home buyer out of the market and to put the homebuilding contractor out of business.

• **California contract**—In Fresno, the UCW contract—which contains some serious implications for the AFL-CIO unions as well as construction management—was spawned by a similar situation.

The Home Builders Association of the San Joaquin Valley, which represents 38 contractors, was an AGC signatory association but claimed for a long time that the AGC does not represent its interests. (As a bargaining group, the AGC covers 42 counties.) Ever since the AGC gave the laborers a 90 cent pay boost over a five-year period last spring, the association has tried to divorce itself from the AGC and the contract.

It notified the two AGC chapters concerned and the unions that it would do its own bargaining. It tried to ex-

New HEAVY-DUTY INTERNATIONAL V-8's

TRUE TRUCK TORQUE
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Greater Gasoline Economy

All-Truck INTERNATIONAL heavy-duty V-8 engines with *True Truck Torque* combine short stroke with low engine rpm. The result: less engine friction and drag. More working power is released *from* the engine, less gasoline is required to maintain it.

More Usable Power at the Wheels

Efficient engine power doesn't pay off until it reaches the wheels. Heavy-duty INTERNATIONAL V-8 Truck transmissions and axle ratios convert low engine rpm into extra-payload hauling power at the wheels where it counts. That's *True Truck Torque!* There's more "go" with more economy because engine, transmission and axle are balanced to match truck, traffic, terrain and job *exactly!*

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INTERNATIONAL model V-225 tractor with 549 cu. in. V-8 engine

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Motor Trucks • Crawler Tractors
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plore with the NLRB the possibility of getting out from under the AGC signatory obligations. It refused to sign the AGG contracts. And it now has a request before the Federal District Court for a ruling that it is not bound by the AGC contract.

The unions wouldn't bargain with the association. The carpenters, cement masons, and laborers struck. For the homebuilders, an open shop situation resulted. UCW, which has never made any headway in California, walked in. It won a privately conducted election by a vote of 112 to 24. The contract followed and contains rates roughly comparable to those established by AGC bargaining. (Carpenters $3.25; plasterers, $3.35; brick masons, $3.70; tilesetters, $3.75; plumbers, $3.80; painters, 3.05 with another 10 cents in the offing. Contract, however, contains more classifications than does the AGC's.)

According to Don Matthews, association secretary, decision to sign a separate contract "stems directly from dissatisfaction with the contracts the AGC has negotiated."

The Fresno and Madera Counties Building Trades Council, AFL-CIO, immediately declared war. It said it will fight to have the AGC contract enforced. And there is little likelihood that specialty contractors with AFL-CIO employees can escape labor difficulties when the latter meet UCW workers on the same job.

Another implication is that the homebuilders' conflict with the AGC is furnishing grist for the right-to-work proponents in the state. (California is the only state where counties have tried to ban the union shop by ordinance.) Some industry people in the state contend that to force AGC rates on small builders in nonindustrial counties, where wage levels are low, leads, as in the Fresno area, to open shop activity. In this sense, union reluctance to recognize the homebuilders has boomeranged with considerable potential injury to AFL-CIO efforts to organize and to halt UCW progress.

AFL-CIO Asks Congress to Up Housing Construction

The AFL-CIO this month called upon Congress to take "immediate and vigorous steps to meet the nation's housing crisis" and to provide through housing construction an "immediate spark for economic recovery."

The call was issued by the federation's Executive Committee.

Noting that less than a million homes were built last year, marking the lowest level in nearly a decade, the AFL-CIO urged action on at least four fronts:

- Expenditure of not less than $500 million a year on slum clearance and urban redevelopment.
- An improved and expanded low-rent housing program embracing a minimum of 200,000 units a year.
- A new moderate-income housing program with low-cost, long-term financing.
- Federal encouragement of cooperative metropolitan area planning for "balanced growth" of metropolitan areas.

Automatic Wage Increases And New Demands Begin

Collective bargaining developments this month brought wage increases ranging from 7 to 19 cents an hour to most construction workers in western Washington, and a shutdown of several major projects in central Connecticut because of a plumbers' demand for a 25 cent wage boost.

The Washington increases were automatic under existing contracts with the Seattle, Tacoma and Mountain Pacific Chapters of Associated General Contractors.

If the 36,500 workers covered by the AGC contracts work an average of 30 hours a week this year, the higher wage rates will increase construction costs by an estimated $10 million.

Increases of 19 cents an hour went to 15,000 members of the carpenters union, 10,000 members of the building laborer's union, and 2,500 members of the painters union. An increase of 15 cents went to 2,000 iron workers, a 16 cent boost to 5,000 operating engineers, and a 7 cent increase to 2,000 teamsters.

New scales include $3.13 for journeymen carpenters, $3.13½ for journeymen painters, $2.70 for common laborers, $3.40 for structural iron workers, $3.20 for reinforcing iron workers, $3.26 for bulldozer operators, $3.63 for crane operators, and $2.87 for flatbed truck drivers.

Affected by the walkout of plumbers and steamfitters in central Connecticut are 30 firms with projects under way in four counties.

According to the Connecticut Association of Plumbing and Heating Contractors, plumbers are asking for a straight increase of 25 cents; steamfitters for an 18 month contract with 25 cents the first 12 months and an additional 15 cents the last six months. (Plumbers now get $3.32 plus 10½ cents for health and welfare and 15 cents for pensions. Steamfitters receive $3.35 plus 7½ cents for health and welfare and 15 cents for pensions).

OFFICIAL PROPOSALS

Bids: January 28, 1958

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
For Construction of
Dike Relief Wells, Dike Observation Wells
And
Groundwater Investigation Wells
St. Lawrence County, New York
Specifications No. PA-5-11035
St. Lawrence Contract No. 44

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for Construction of Dike Relief Wells, Dike Observation Wells and Groundwater Investigation Wells, St. Lawrence County, New York, until 10:30 A.M. Eastern Standard Time on the 28th day of January, 1958, at the Authority's office, 18th floor, the Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are:

Estimated:	
Constructing relief wells	600 lin. ft.
Furnishing and installing 6 inch diameter plastic pipe	2000 lin. ft.
Constructing observation wells (including installing 2 inch plastic pipe)	900 lin. ft.
Drilling and casing 6 inch I.D. wells	1100 lin. ft.
Drilling 5½ inch diameter wells below casing	500 lin. ft.
Furnishing and installing 2 inch riser pipe	300 lin. ft.

All work shall be completed on or before July 1, 1958.

Plans, Specifications and Proposal Forms for the work may be obtained from the Power Authority of the State of New York, at the 18th floor, the Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten Dollars ($10.00) per initial set of contract documents, and Five Dollars ($5.00) per set for additional sets, no part of which will be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the maximum price bid for any bid schedule.

The right is reserved to make award on any one or more of the above schedules, separately or in combination, as fully described in the Proposal, and to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

U. S. Government

Sealed bids will be received in the office of the Engineering and Construction Director, Panama Canal Company, Balboa Heights, Canal Zone, until 1:00 P.M., February 10, 1958 and at that time will be publicly opened, for the work and material required in the modernization of the Administration Building, Balboa Heights, Canal Zone. The work consists of installation of a new power feeder, replacement of all lighting fixtures and wiring, installation of suspended ceilings, replacement of elevator, and complete air conditioning of the building. Data are available for examination in the office of Chief, Procurement Division, Panama Canal Company, 21 West St., New York 6, N. Y. Complete sets may be obtained by prospective bidders upon payment of $25.00 deposit which will be refunded when data are returned within 40 calendar days after bid opening. Telephone Bowling Green 9-5380, extension 130.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, P.O. Box 12, New York 36, N. Y.

Bids: January 30, 1958.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 30th day of January 1958, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. NICKERSON, District Engineer, 353 Broadway, Albany 1, New York						
Saratoga	FISH 58-24 FARC 58-17	Interstate Route 502, Sect. 2, Cont. 3 (Mohawk River to Clifton Park); Lapes Corners–Clifton Park, S.H. 8137 Mechanicville–Clifton Park, S.H. 1345 and various Cross and Access Roads Project I-1119(11); S-202(3)	6.45 (5.93 ACC.)	9" Cem. Conc. Pavt. 2 @ 36' Var. Wide = 9.10 Miles Asphalt Concrete = 1.52 Mi. Graded Gravel Top Course = 1.28 Mi. Misc. Work = 0.48 Mi. 5 Hy. Sups. Comp. I-Beams 395', 359', 344.7'; 320' and 156.5'.	$360,000 Plans $20	$6,533,000
DISTRICT No. 8, K. G. RAUER, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Putnam	FESS 58-17	Farmers Mills Road, C.R. 402 Proj. ER-83(1)	0.18	Bit. Surf. Treat. Granular Bottom Course Comp. I-Beam Bridge 40'	$5,000 Plans $2	$87,000
Putnam	FESS 58-18	Peekskill Hollow Road, C.R. 201 Church Street, C.R. 202 Project ER-89(1); ER-90(1)	0.40	Bit. Surf. Treat. Granular Bottom Course 2 Comp. I-Beam Bridges 76' and 61'	$23,000 Plans $3	$417,000
DISTRICT No. 10, M. E. GOTT, District Engineer, 325 W. Main Street, Babylon, L.I., New York						
Bronx	FICBE 58-2	Cross Bronx Expressway, Cont. 6, (Clay Avenue to Fulton Avenue) and various Cross Streets and Service Roads Project I-U-1084(30)	0.45 (0.74 ACC.)	9" Cem. Conc. Pavt. with Carb. Black 2 @ 39' Var. Wide = 0.38 Mi. Sheet Asphalt Pavt. = 0.69 Mi. Granite Block Pavt. = 0.05 Mi. Misc. Work = 0.07 Mi. Viaduct Comp. Plate Girders 1566.8'	$320,000 Plans $20	$5,863,000
Nassau	PSC 7278	Elimination of Grade Crossings of the Long Island Railroad with various Streets in Freeport	2.26 (0.56 ACC.)	Track Relocation, Freight House, Station and Misc. = 2.26 Mi. 9" Cem. Conc. Pavt. Var. Wide = 0.50 Mi. Asphalt Concrete Pavement = 0.06 Mi. 7 R.R. Sups. Plate Girders 80', 78', 76', 87', 86.5'; 117.5'; and 100' 1 Viaduct 1874'	$361,000 Plans $20	$6,565,000
Nassau and Suffolk	SSPRC 58-1	Southern State Parkway, Cont. 8A	4.41	Landscaping	$14,000 Plans $3	$251,000
Queens	P.S.C. T.C. 3518, 3519, 3607	Elimination of Grade Crossings of the Long Island Railroad with Various Streets (Old Southern-Rosedale, Westerly Section) (South Road, Jamaica to Springfield Boulevard, Laurelton)	3.18 (0.68 ACC.)	Track Relocation and Misc. Work = 3.18 Mi. Asph. Conc. Pavt. = 0.68 Mi. 9 R.R. Sups. Plate Girders 79', 94', 101', 186', 98', 93.5'; 106.5', 89', 133.5' 2 Ped. Underpasses W.F. Beam 34' Each	$400,000 Plans $20	$7,635,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: January 23, 1958

Soil Explorgtions and Foundation Investigations

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Eastern Standard Time, on January 23, 1958, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 505, BROOME COUNTY LINE TO 0.22 MILES SOUTH OF INTERSECTION OF STATE ROUTES 11 AND 41 AT POLKVILLE, PROJECT 1-1127(1), ITEM 36, CORTLAND COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. FA-SM-113.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.
(b) Mr. Earl E. Towlson, District Engineer, New York State Department of Public Works, 333 East Washington Street, Syracuse, New York.
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.

The Engineer's Estimate of cost for this work is $35,975.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $2,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: January 30, 1958

Contract U.S.-96, Erie Canal

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Barge Canal Improvement Law and Highway Law, sealed proposals will be received, until 10:30 A.M., E.S.T., January 30, 1958 by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, the Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract U.S.-96 for New Gates, Lining the Lock Wall and Miscellaneous Work at Lock 21, Erie Canal, Oneida County, New York.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.

(b) Department of Public Works, 270 Broadway, New York City, N. Y.

(c) In addition to the above mentioned offices, plans, maps and specifications for Contract U.S.-96 may be examined and obtained at the office of Mr. Lacy Ketchum, 109 North Genesee Street, Utica 1, New York.

The deposit for Plans and Proposal Forms for Contract U.S.-96 is $15.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids: refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's Estimate of Cost for Contract U.S.-96 is confidential and will be made known at the time of receiving bids. Proposals for Contract U.S.-96 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of five percentum, (5%) of the bid. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Barge Canal Improvement Law and to the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: February 11, 1958

Contract BP-160.009

THE PORT OF NEW YORK AUTHORITY
BROOKLYN-PORT AUTHORITY PIERS
NEW PIER 10
PIER SHED

Sealed proposals for the construction of a pier shed on New Pier 10 at the Brooklyn-Port Authority Piers, Brooklyn, N. Y., will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, February 11, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $50.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $50.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, January 16, 1958

Bids: January 30, 1958

The Furnishing and Delivery of 130 MVA Two-Winding Power Transformers for Reynolds Substation

Power Authority of the State of New York
Supplemental Transmission
ADVERTISEMENT FOR PROPOSALS
for
Specification No. PA-8-4
Contract No. TP13

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the design, manufacture and furnishing of three (3) 130 mva two-winding transformers and associated equipment and delivery thereof, f.o.b. cars at destination until 10:30 A.M. Eastern Standard Time on the 30th day of January, 1958 at the Authority's office, 18th floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place proposals will be publicly opened and read aloud.

Bids will be received for the transformers and associated equipment and services in accordance with the bidding schedule. Installation of the transformers and associated equipment will be done by Others, but services of erecting engineers shall be provided by the manufacturer when and if required. Delivery of the transformer and associated equipment will be required October 1, 1958.

Plans, Specifications and Proposal Forms may be obtained only from the Power Authority of the State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten Dollars ($10.00) for initial set of Contract Documents and Five Dollars ($5.00) for each additional set, no part of which will be refunded. Two sets must be returned with each bid.

Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the office of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, for the inspection by prospective bidders.

Bids will not be restricted to American manufacturers.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than twenty (20) percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

Bids: February 4, 1958

Contract PN-250.012

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
COMPLETION OF CONNECTING WATER MAIN TO PUMPING STATION

Sealed proposals for the construction of a section of water main and a valve chamber at Port Newark, New Jersey, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, February 4, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, January 16, 1958

Bids: January 30, 1958

Soil Explorations and Foundation Investigations

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Eastern Standard Time, on January 30, 1958, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 505, INTERCHANGE AREA AT COUNTY HIGHWAY 34 TO INTERSECTION WITH ROUTE 12, ABOUT FOUR MILES SOUTHWEST OF ALEXANDRIA BAY VILLAGE, SECTION 7E, OMAR SWAMP, PROJECT I-111(3), JEFFERSON COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. FA-SM-116.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.

(b) Mr. Robert W. Sweet, District Engineer, New York State Department of Public Works, 444 VanDuzee Street, Watertown, New York.

(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.

The Engineer's Estimate of cost for this work is $15,502.50.

Proposal for this contract must be submitted in seperate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

Bids: February 11, 1958

Contract BP-160.010

THE PORT OF NEW YORK AUTHORITY
BROOKLYN-PORT AUTHORITY PIERS
NEW PIER 10
PAVING AND UTILITIES

Sealed proposals for the construction of the yard and pier floor paving and utilities for New Pier 10 at the Brooklyn-Port Authority Piers will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, February 11, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, January 16, 1958

OFFICIAL PROPOSALS

Prequalification Date: January 23, 1958

Board of Education
Bureau of Construction

Notice Re: Prequalification Forms for Contractors

NOTICE IS HEREBY GIVEN THAT The Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y. will receive applications for prequalification from contractors who may wish to submit bids for the proposed hereinafter specified contracts as follows:

Athletic Field Improvements, General Construction, Plumbing and Drainage, and Electrical Work at the Franklin K. Lane High School, Jamaica Avenue and Dexter Court, Brooklyn.

Playground Development including plumbing and drainage at Public School 33, Bronx. Jerome Avenue and East 184th Street.

Estimated Cost of each contract $45,000.00. Prequalification application forms will have to be secured from and must be submitted to the Superintendent of School Buildings, Bureau of Construction, 4th Floor, 42-15 Crescent Street, Long Island City 1, New York, Room 407.

Bids when advertised, will be received from prequalified bidders only.

Time for submitting prequalification applications by contractors will expire on Thursday, January 23, 1958.

WILLIAM H. CORREALE
Superintendent of School Buildings,
Design and Construction

Dated: January 8th, 1958

Bids: February 6, 1958

Contract O & M 465

THE PORT OF NEW YORK AUTHORITY
CLOSED CIRCUIT T.V. — RUNWAY 4-22
LA GUARDIA AIRPORT

Sealed proposals for a closed circuit T.V. on runway 4-22 La Guardia Airport will be received at the office of the Director of Purchase of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, N. Y. until 11:00 A.M., Thursday, February 6, 1958 at which time and place proposals will be opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

Bids: April 14, 1958

Kingdom of Thailand
Royal Irrigation Department

The date for opening bids is hereby changed from 10 a. m., Bangkok Standard Time, March 7, 1958, to 10 a. m., Bangkok Standard Time, April 14, 1958.

M. L. Xujati Kambhu
Director General
Royal Irrigation Department

Bids: March 31, 1958

Government of Iraq
Electrification of
Central Euphrates Zone
Contract No. 17
Switchgear and Associated Equipment

The Development Board and Ministry of Development of the Government of Iraq invite tenders from qualified firms for the supply, delivery, erection and supervision of operation of the 132 kV, 66 kV, and 11 kV Switchgear and Associated Equipment for the Baghdad-South Power Station and seven substations in the Central Euphrates Zone.

Full information regarding this tender can be obtained on and after Jan. 2, 1958 from Embassy of Iraq, Washington or Messrs. Electrobel—Traction et Electricité, 1, Place du Trône, Brussels, Belgium.

All Tender Documents are to be submitted in English to the Ministry of Development, on or before 12 noon, local time, on March 31, 1958.

Minister of Development

OFFICIAL PROPOSALS

Bids: January 30, 1958

Contract U.S.-95
for Lock 12, Erie Canal

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Barge Canal Improvement Law and Highway Law, sealed proposals will be received, until 10:30 A. M., January 30, 1958 by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract U.S.-95 for New Gates and Lowering the Lower Sill at Lock 12, Erie Canal, Tribes Hill, Montgomery County, New York

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.
(b) Department of Public Works, 270 Broadway, New York City, N. Y.
(c) In addition to the above mentioned offices, plans, maps and specifications for Contract U.S.-95 may be examined and obtained at the office of Mr. Lacy Ketchum, 109 North Genesee Street, Utica 1, New York.

OFFICIAL PROPOSALS

The deposit for Plans and Proposal Forms for Contract U.S.-95 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's Estimate of Cost for Contract U.S.-95 is confidential and will be made known at the time of receiving bids.

Proposals for Contract U.S.-95 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of five percentum, (5%) of the bid. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Barge Canal Improvement Law and to the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

EMPLOYMENT OPPORTUNITIES

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Superintendent thoroughly qualified, large sewer & watermain installations. Permanent, N. Y. State. P-6844, Engineering News-Record.

Wanted: Civil Engineer experienced in water filter plant design and deep well water supply in coastal areas. Give complete educational and experience record and salary requirements. P-6900, Engineering News-Record.

Wanted—Experienced Engineers to prepare plans for Water Filtration Plants and/or sewage Treatment Plants. State experience, salary requirements and when could report. P-7015, Engineering News-Record.

Help Wanted—Male Experienced Graduate Engineer for structural steel take-off and estimating. Box 955, New Haven, Conn. Must hold, or be able to procure immediately, Conn. State License.

Designer-draftsman, preferably in 30's with mechanical and electrical experience, capable of making plumbing and electrical layouts for one-family and row house developments in Florida, Carribbean and Middle East. Ability to write outline specifications desirable. Occasional travel involved. Salary $150-$175 per week. Retirement benefits, life insurance and medical care included. P-6977, Engineering News-Record.

Engineers qualified by experience for positions as resident engineers on sewer construction, also well qualified inspectors for Ohio municipal projects. P-6960, Engineering News-Record.

Civil and sanitary engineers qualified by training and experience on design of municipal water and sewage treatment projects. Please provide complete information and references. Old consulting organization. P-6972, Engineering News-Record.

Construction superintendent, thoroughly qualified in estimating and field supervision. Must have experience and references. Steady employment. Iowa and Illinois location. State education and expected salary. P-6964, Engineering News-Record.

Assist. Prof.—To teach undergrad. courses in surveying and highway engineering. Salary depends on qualifications. Dept. of Civil Eng., Univ. of N. Dakota, Grand Forks, N. Dak.

POSITIONS VACANT

Hydraulic Engineers—Civil Engineer Graduates—All grades, interested or experienced in Stream Flow Measurements, analysis of Hydrologic data, Hydraulic design criteria for dams, channels and bridges for regulatory agency. Duties include review of plans and specifications, report writing, operation of stream-gaging network, interpretation of stream flow data, field investigations and inspections, with some travel and public relations. Salary depending on experience. Location Harrisburg, Pennsylvania. P-6828, Engineering News-Record.

Civil Engineer to 25. MIT, Ivy League or similar school with outstanding management potential. Excellent opportunity, well established New York City building contractor. Must be available for interview New York City. P-7019, Engineering News-Record.

Experienced Estimator—General Contractor, commercial, industrial, civic and school construction, $100,000 and over. New Hampshire Civil Engineer or equivalent. Send resume of education, experience and salary required to P-6722, Engineering News-Record.

Construction Sales Manager to 33. Graduate engineer, preferably civil, with outstanding management ability. Well established New York City building contractor. Must be available for interview in New York City. P-7011, Engineering News-Record.

Roofing Materials Man—Man with 5-10 years experience and knowledge of all types of roofing materials, including the "know-how" of built-up roofing. College degree desired but not required. Position provides unlimited opportunities in new product development, marketing, and sales. Submit personal resume to P-7033, Engineering News-Record.

EMPLOYMENT SERVICE

Better Positions—$6,000 to $35,000. Want a substantial salary increase, more opportunity or different location? This national 47 year old service connects you with best openings. You pay us only nominal fee for negotiations: This we refund when employer pays placement fee. Present position protected. In complete confidence, write for particulars, R. W. Bixby, Inc., 559 Brisbane Bldg., Buffalo 3, N. Y.

POSITIONS WANTED

Civil Engineer — Professional — Land Surveyor: Consultant; Construction, Per Diem or Contract; Anywhere; Resume on request. PW-6904, Engineering News-Record.

(Continued on opposite page)

EMPLOYMENT OPPORTUNITIES

NATIONAL COVERAGE

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant
Positions Wanted
Part Time Work

Civil Service Opportunities
Selling Opportunities Wanted
Selling Opportunities Offered

Employment Agencies
Employment Services
Labor Bureaus

DISPLAYED —RATES— **UNDISPLAYED**

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

$2.40 per line, minimum 3 lines. To figure payment count 5 average words as a line.
Position Wanted ads are ½ of above.
Box Numbers—counts as 1 line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.
Not subject to Agency Commission.

Send NEW ADS or inquiries to Classified Adv Div of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36, N. Y. Jan. 30th Issue Closes Jan. 20th

CIVIL ENGINEER

Consultant in midwest needs engineer well versed in concrete control and concrete paving practice. Must have degree and be over 30 years. Salary $8,000 minimum. Submit complete resume.

P-6946, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

QUANTITY SURVEYOR

Require man for quantity take-off and analysis in connection with estimating for Contractor engaged in all types of heavy construction.

A. S. WIKSTROM, INC.
Skaneateles, N. Y.

POSITIONS WANTED

(Continued from opposite page)

Project or Office Engineer, MCE, 34, 9 years experience in idustrial and heavy construction, desires position in middle Atlantic states or Florida. PW-6909, Engineering News-Record.

Mgr. or Gen. Supt.; 30 years experience in all phases of general construction; earthmoving, heavy rock, dam, airfields, roads, asphalt or concrete paving, power houses, docks, concrete and steel structures, bridges. Available immediately. Foreign or domestic. Have well qualified following of key men. Resume upon request. PW-6917, Engineering News-Record.

Construction Engineer B.C.E. 9 years experience in building construction, field and office engineering, field supervision, expediting, estimating and project engineer. Reply PW-6934, Engineering News-Record.

Construction and Engineering—24 years' experience. Last 10 years heavy concrete construction. Graduate C.E. General construction management, engineering, supervision, estimating, including quantity analysis to bid pricing, contract negotiations and labor relations. Will consider foreign assignment. PW-6970, Engineering News-Record.

Construction Executive. 20 years experience in Heavy Construction. Airports, Expressways, Highways. Power Plants, general grading and concrete construction. Estimating thru pricing. Construction supervision. Desire permanent position with well-established contracting firm in southeastern U.S. Presently employed. PW-6978, Engineering News-Record.

Heavy Construction Engineer-Manager, extensive paving and earthwork experience—Best References—available in January, for permanent position only, with a stable progressive firm. Keith Jared, 1490 Belew, Irving, Texas. Phone Blackburn 3-7533.

Construction Supt. General Construction. PW-6827, Engineering News-Record.

Civil Eng. 25, 7 yrs. Exp. Bidding, estimating, constr. all types roads incl. asphalt plus masonry bridges, presently contractors office & field eng., desires position with contractor, preferrably Midwest. PW-6997, Engineering News-Record.

Structural Engineer, B.C.E., age 32, 11 years railroad bridge engineering. Design, estimating, field inspection & supervision. Desires responsible office or liason position. PW-6998, Engineering News-Record.

Construction Sup't., Chief Engineer, graduate, 12 years exp. harbors, pile driving, mining and metallurgical plants, industrial const. 7 yrs. foreign exp. prefer foreign pos. PW-6990, Engineering News-Rec.

Mining Engineer, seven years underground development, production, tunnel, shaft and exploration supervisory experience, speak Spanish, married, will go foreign. PW-6994, Engineering News-Record.

When Answering

BOX NUMBERS . . .

to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

POSITIONS WANTED

Construction Man available early 1958. Twenty years competitive experience on Federal, Municipal and Institutional projects. Cost conscious and good organizer for both bidding and building. Prefer percent-of-profit agreement. Will consider all opportunities. PW-6981, Engineering News-Record.

Construction Manager, available soon for responsible connection Western U. S. Experienced, 25 yrs. Supervising, Managing, Estimating, bidding of Industrial, Commercial, Municipal and Federal building and heavy Construction for General Contractors. PW-6992, Engineering News-Record.

Chief Estimator—Project Manager, 38 years old, 17 years experience. Owner contacts, subcontract negotiation, field supervision, pricing and cost controls. Wide range experience, all types heavy industrial building. Desires position of heavy responsibility, southeast or midwest. Presently employed, minimum salary $12,000. PW-6999, Engineering News-Record.

Acct. Office Mgr. Fully experd. all field and office detail for Industrial, Highway etc. const. Available at once. PW-7000, Engineering News-Record.

Project Manager or Superintendent for architect or contractor available February. Now completing luxury type 325 room El San Juan Hotel. Working knowledge Spanish and French. Also experienced heavy construction and housing. Age 44, single. Airmail replies to: Allen McSherry, P.O. Box 6034, Loiza Station, Santurce, Puerto Rico.

Civil Engineer, 47, married, over 20 years experience in Highways, Public Works, Railroads, Airports, Industrial and Defence projects, Domestic and Foreign. Will travel. Foreign assignment acceptable, if conditions and salary right. PW-7002, Engineering News-Record.

Superintendent or Estimator thoroughly experienced and qualified to handle all phases of job from bid to completion: Sewage and Water Treatment Plants, Power Plants, Building Const., Bridges, Foundations, Cofferdams, Piling, Reinforced Concrete. PW-7010, Engineering News-Record.

Construction Superintendent now employed desires change. Industrial, commercial, chemical plants. Atlantic States preferred. PW-7020, Engineering News-Record.

Field Engineer—Asst. Supt.—Age 27, 9 yrs. exp.—Hwys., bridges, bldgs. Good N.Y.C. labor connections in bldg. const. want steady position—good references—available Feb. 1st. PW-7023, Engineering News-Record.

BS in EE with 27 years experience in engineering and construction work: Airfields, Power plants, Power distribution, Branch wiring, POL, Concrete and steel Structures, Plumbing and Heating, Radio and Telephone Communications. Office or field. Available immediately, domestic or foreign. PW-7027, Engineering News-Record.

Canadian Consulting Engineer, civil, seeks short term foreign jobs. Salary or fee basis. PW-7025, Engineering News-Record.

Consulting Mechanic Engr., practicing in Florida, seeks connection as Florida representative of engineering organization. PW-7035, Engineering News-Record.

Construction Superintendent now employed desires job with general contractor on estimating, sub-contractors, shop drawings, scheduling, costs, etc. PW-7034, Engineering News-Record.

EQUIPMENT MAINTENANCE SUPERINTENDENT

A challenging opportunity is open to the properly qualified man with one of the largest highway and heavy-duty off-highway fleets in the country. The man we are looking for should be prepared to take complete charge of a large repair and preventive maintenance shop and handle all labor and vendor relations connected thereto. Salary is open and will be geared to experience and performance. Write, giving job and personal history particulars.

P-6709, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

Unusual Opportunity for

EXPERIENCED CONSTRUCTION MACHINERY SALES SPECIALIST

If you are looking for the opportunity to grow with a nationally known manufacturer of road building and construction machinery, this is your chance. We are seeking an experienced man, 30-45 years old, as a sales specialist with headquarters in Milwaukee. Engineering degree or technical background desirable, but most important qualifications are experience and ability to supervise selling of concrete batching and road building machinery through distributors. Salary with all traveling expenses paid. Give personal statistics and experience history in reply. Replies confidential.

CHAIN Belt Company
Post Office Box 2022, Dept. M
Milwaukee 1, Wisconsin

OFFICE ENGINEER
RESIDENT ENGINEER
DRAFTSMEN

Positions available for men with experience in hydraulic and sanitary engineering. Water supply, sewerage and drainage projects.

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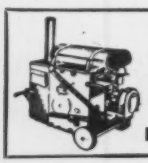

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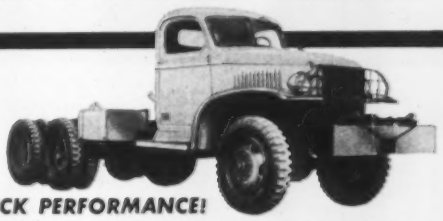

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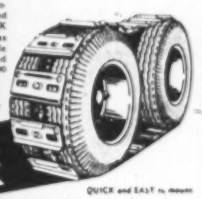

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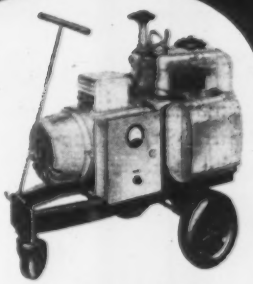

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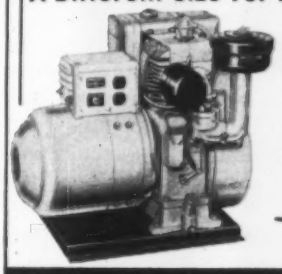

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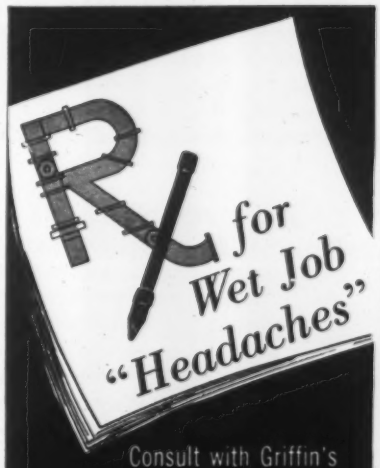

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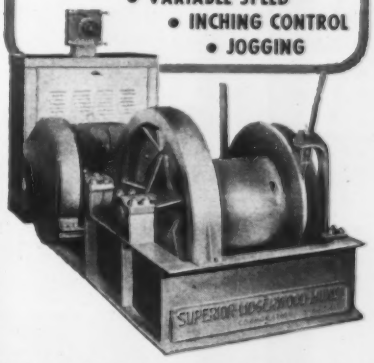

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Challenge to Homebuilders

HOMEBUILDERS WATCHED PRIVATE HOUSING STARTS decline in 1957 to under one million. And a spokesman for the industry, Richard G. Hughes of the National Association of Home Builders, has said that without government action, many NAHB members anticipate a drop of 10% this year.

There is little doubt that action will be taken by the government to restore buying confidence on the part of the public. Homebuilding should remain a healthy industry, not only for its own sake, but also for the vast number of industries that benefit directly from a surging housing market—building materials suppliers, appliance manufacturers, the rug and carpet makers, the furniture producers.

But, the full responsibility for housing should not rest upon the government. Builders must assume a share of that burden, which more and more in the past, they have been shifting to federal agencies.

True, they are dependent on the money market—a market almost completely regulated by the federal government through the Federal Reserve Board. This agency has drawn the strings of credit tight, only recently making any effort to ease the money pinch which had hit hardest at mortgage funds. Further loosening of the money supply appears still to be needed.

The housing drop, however, cannot be blamed entirely on a tight mortgage market. There is ample evidence that homebuilders contributed to the slide by constantly pricing their product out of the range of the low and middle-income families. So another way to revive the industry is to lower the price of housing. But this is not likely to be successful if the decrease results only from a reduction in the size of a house or from use of inferior materials and construction. The objective must be to build high-quality dwellings at low cost.

Prefabricators have long had their sights on the low-price market, and until suddenly shifting emphasis to higher brackets, made steady gains. Now, manufacturers of mobilehomes have rocketed ahead in a market almost abandoned by both prefabricated home manufacturers and builders (see p. 40). It is interesting to note that housing starts would have been over the million mark if buyers of mobilehomes had purchased conventional houses instead.

Several builders today are constructing and selling in substantial numbers good-size, well-built houses at $10,000 or less, so there exists proof that the goal can be reached. (See, for example, p. 52 and ENR Jan. 17, 1957, p. 33.) For those builders, and others like them, the problem is partially solved.

But for the entire industry, there remains the problem of adequate mortgage funds. And then, it has not been so much a shortage of money as it has been the refusal of lending institutions to lend money for housing at rates they justifiably felt were inadequate. These were the mortgages insured by the Federal Housing Administration or guaranteed by the Veterans Administration. Conventional mortgages, unhindered by government restrictions, more than held their own last year.

This is the challenge—less dependence on the government by builders, and thereby more freedom to act without interference from federal agencies. One idea, perhaps, would be the establishment of a mortgage insurance plan by the National Association of Home Builders. The government has pointed the way in this respect, but also has assumed the risk. For a change, under a private insuring plan, let the builders of the nation assume the risk, as is their privilege under the system of free enterprise which we all hold dear.

Sense on Scientific Manpower

THE CONGRESS NOW IN SESSION had better take a good, hard look at bills for increasing the nation's technical manpower. For not all the Sputnik-inspired proposals will get to the heart of the problem. We need quality, not mere quantities of engineering and science graduates. We need teachers and physical plant for our colleges, not necessarily more students.

In the next 10 or 15 years, college enrollments are expected to double—without artificial impetus of special scholarship programs. As enrollment doubles, the American Society for Engineering Education foresees that 9,584 new engineering teachers will have to be found (we had a total of 9,078 last year).

We need teachers, not students; engineering leaders were stressing this last week. Clark A. Dunn, vice president of the National Society of Professional Engineers, issued a blast at the Administration's plan for 10,000 undergraduate science and engineering scholarships annually for four years: "A new influx of additional enrollments will strain the faculty and facilities . . . beyond the breaking point," said educator Dunn.

Emphasis should be on quality, not quantity. In Washington last week at the Highway Research Board meeting, Maynard W. Boring, General Electric Company's technical manpower authority and a former president of ASEE, said: "The biggest block in our scientific education program today is not lack of students. Without good teachers—real teachers, well-paid, well-trained, dedicated teachers—we may be making a lot of poor engineers out of potentially good dishwashers."

And in New York, taking office as president of Engineers Joint Council, Enoch R. Needles made the quality point in a speech warning the profession against "a glut of mediocrity."

It is well that men acquainted with the engineering education problem are talking up.

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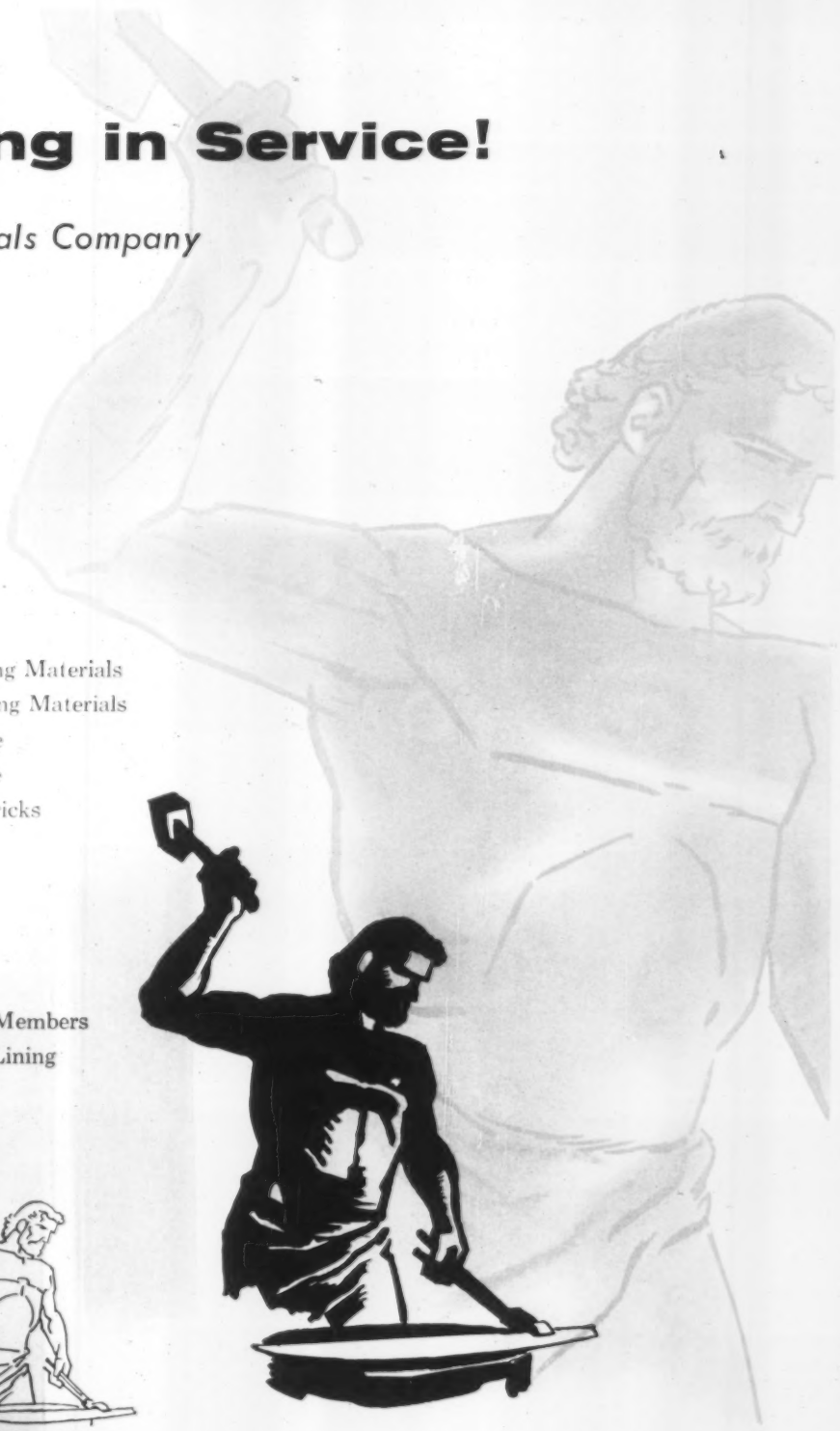

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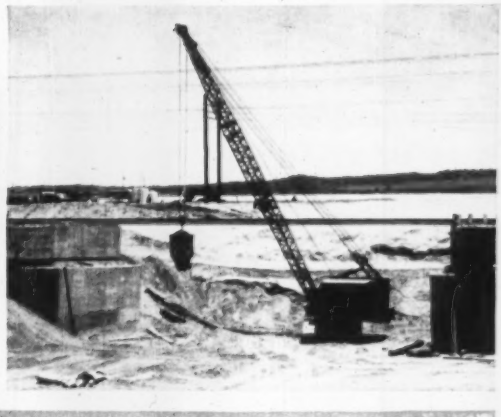

Horner Construction Co. uses extra high strength "POWERSTEEL" on Air Force Academy access bridge construction

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